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Geotechnical and Geoacoustic Properties of Sediments Off South Florida: Boca Raton, Indian Rocks Beach, Lower Tampa Bay, and the Lower Florida Keys

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The Naval Research Laboratory (NRL) and the University of South Florida (USF) have been funded by the Office of Naval Research to provide ground truth data for the acoustic classification systems that will be tested on the Florida Atlantic University (FAU) Unmanned Underwater Vehicle (UUV), specifically FAU's Chirp sonar and quantitative side scan sonar. The Sampling, Mapping, and Chirping (SMAC) Expedition off Boca Raton, FL, in November 1994 was the first of several collaborative field efforts between NRL, USF, and FAU. The second field effort was conducted in the Lower Florida Keys in February 1995. The third joint field effort was conducted in June 1995 in the St. Petersburg/Tampa area; specifically in the lower extent of Tampa Bay near Egmont Key and off Indian Rocks Beach. This report is a vehicle to disseminate NRL geologic, geotechnical, and geoacoustic data collected on the joint cruises.

14. SUBJECT TERMS

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1.0 Introduction

The Naval Research Laboratory (NRL) and the University of South Florida (USF) have been funded by the Office of Naval Research to provide ground truth data for the acoustic classification systems that will be tested on the Florida Atlantic University (FAU) Unmanned Underwater Vehicle (UUV), specifically FAU's Chirp sonar and quantitative side scan sonar. The Sampling, Mapping, and Chirping (SMAC) Expedition off Boca Raton, Florida in November 1994, was the first of several collaborative field efforts between NRL, USF, and FAU. The Second field effort was conducted in the Lower Florida Keys in February, 1995. The third joint field effort was conducted in June, 1995 in the St. Petersburg / Tampa area; specifically in the lower extent of Tampa Bay near Egmont Key and off Indian Rocks Beach. This report is a vehicle to disseminate NRL geologic, geotechnical, and geoacoustic data collected on the joint cruises. The FAU and USF data can be viewed in a different report (Mallinson et al., 1996). A sample summary is reported in tabular form as Table 1.0.1.

1.1 Boca Raton, Florida

The site off Boca Raton (BR) was chosen to provide a testing area for FAU to test their Chirp sonar acoustic system. The site (Figure 1.1.1) was located approximately 5 miles offshore in a wave-dominated environment comprised of carbonate-siliciclastic sands. Seven sites were occupied in this test area immediately off Boca Raton. At each of the Seven BR sites (Figure 1.1.2, Table 1.1.1), four diver cores were taken, in situ shear wave and compressional wave velocity was measured using the In Situ Sediment Acoustic Measurement System (ISSAMS), and bottom stereophotographs were obtained by divers for later analysis of bottom roughness. Laboratory analyses of bulk density, grain density, water content, void ratio, porosity, and grain size were performed on core samples shortly after collection of the cores. The cores were subsequently sampled for fabric at NRL and analyzed by image analysis to determine physical properties at scales too small to sample.

1.2 Dry Tortugas and Marquesas Keys, Florida

The test sites in the Dry Tortugas and Marquesas Keys were chosen as end member sites, carbonate sediments greater than 90% $CaCO_3$, that act as an analog environment to critical Navy areas of interest; e.g. The Persian Gulf. The Florida Keys are the only pure carbonate environment in the continental United States.

The Dry Tortugas test site is a low energy, back-reef environment near the Southeast Channel of the Dry Tortugas (Figure 1.2.1); it is protected by the Keys from physical agitation except during major storm events (Ball et al., 1966; Perkins and Enos, 1968). The Marquesas test site (Figure 1.2.1) is an unprotected, high-energy environment north of the Marquesas Keys subject to frequent storm events. Water depths in both test sites range from 20 to 29 m and semi-diurnal tides range from one to two meters (U.S. Department of Commerce, 1995). Holocene sediment thicknesses average 2.5 to 4.5 m. The Holocene sediments overlie the Key Largo Limestone, a Pleistocene-age basement

Table 1.0.1 Summary of physical property, geoacoustic property, geotechnical property, and microscopy samples.

	Issams Stations Vp,Vs	Dias Vs Profiles	# Cores	# Index Property Samples	Grain Size	Lab Vp	Microfabric Samples	Image Analysis	Stereo Pairs	Digitized Pairs
Boca Raton	7, 7	4	35	144	36	486	31	8	148	27
Indian Rocks Beach	3,1	0	16	29	10	114	0	0	68	20
Lower Tampa Bay	7,0	0	18	78	19	294	0	0	0	0
Lower Florida Keys	22,22	12	79	3800	420	2832	128	3	88	18
Total	39,30	16	148	4051	485	3726	159	11	304	65

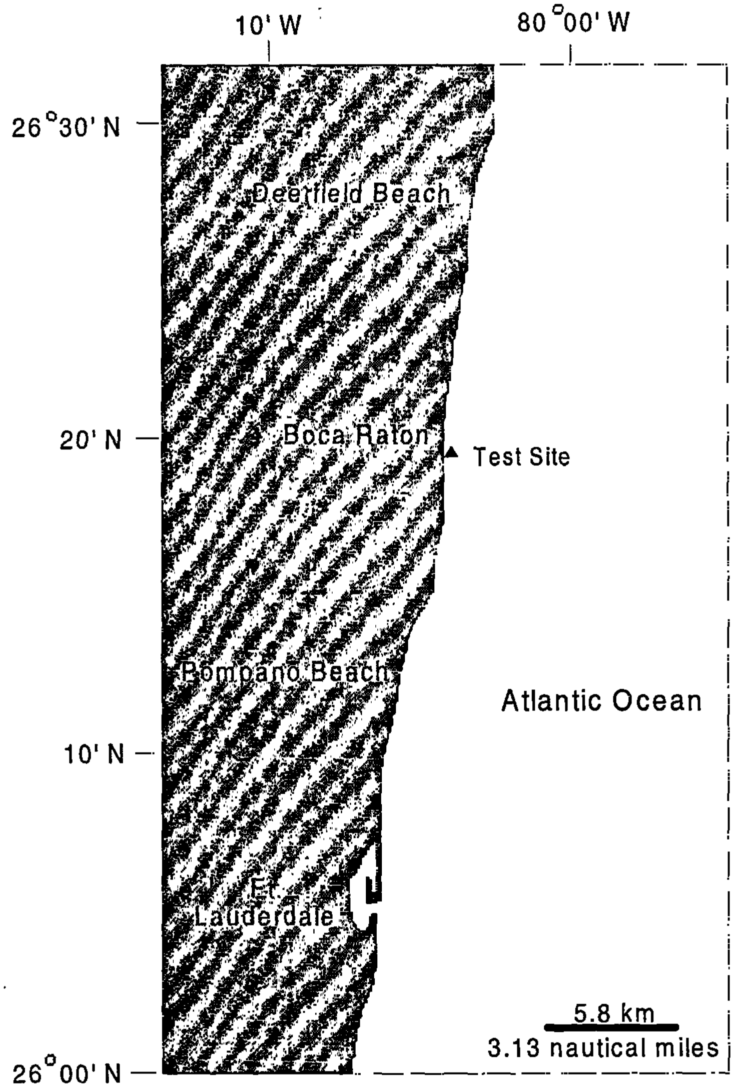


Figure 1.1.1 Boca Raton test site location map

rock (Harrison and Coniglio, 1985; Hoffmeister et al., 1967; Hoffmeister and Multer, 1968). The overlying sediments consist primarily of lime muds produced by coralline algae (Hudson 1985; Lowenstam, 1955; Stockman et al., 1967; Wefer, 1980) and abraded and broken mollusc shells. Constituent particles include aragonite needles, fragmented *Halimeda* plates, gastropods, and, to a lesser degree, benthic foraminifers, sea urchin spines, barnacles, spiny oysters, worm shells, bivalves, coral fragments, and few quartz grains. The sediments are composed of about 90% $CaCO_3$ (Briggs et al., 1996) with at least 50% of the total sediment composed of aragonite. The non-aragonitic $CaCO_3$ fraction is composed of high-Mg calcite and low-Mg calcite. The non-$CaCO_3$ fraction is composed of quartz grains, organic matter, and undetermined amorphous particles.

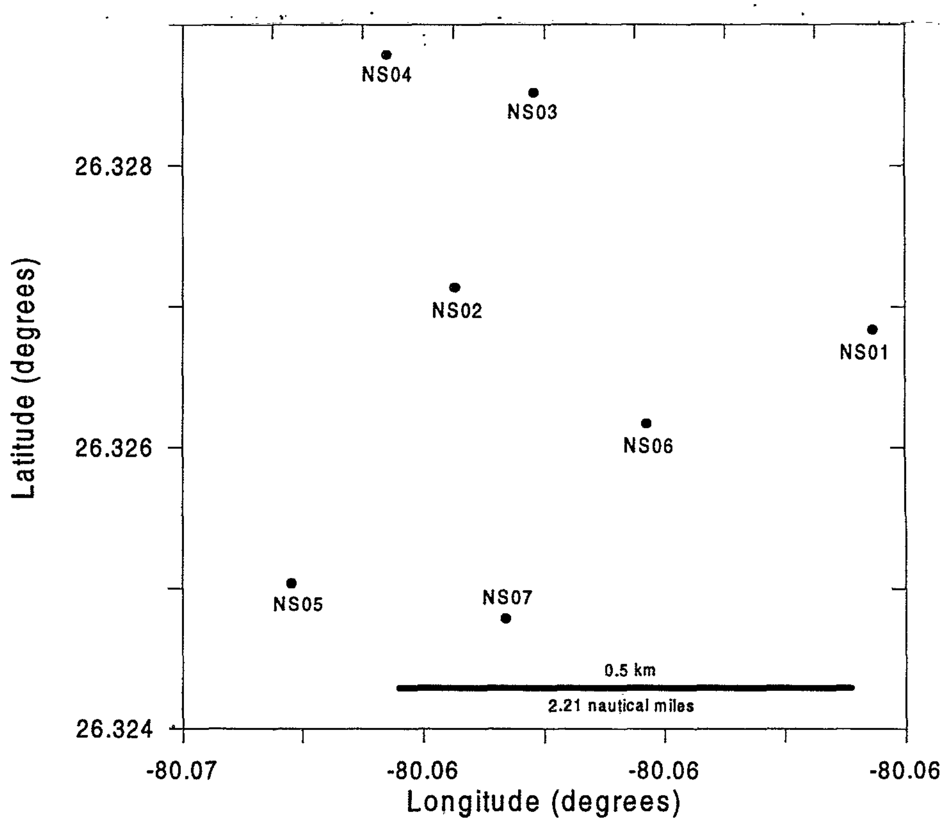


Figure 1.1.2 Boca Raton station location map

Table 1.1.1 Boca Raton core location sites.

Station	Latitude	Longitude	Depth (m)
NS01	26° 19.608' N	80° 3.616' W	22
NS02	26° 19.628' N	80° 3.824' W	17.5
NS03	26° 19.711' N	80° 3.785' W	20
NS04	26° 19.727' N	80° 3.858' W	17
NS05	26° 19.502' N	80° 3.905' W	15
NS06	26° 19.570' N	80° 3.729' W	20
NS07	26° 19.487' N	80° 3.799' W	19

NRL collected 46 gravity cores, 30 diver cores, and 1 box core from the Dry Tortugas (Figures 1.2.2, 1.2.3, 1.2.4, Table 1.2.1) and Marquesas (Figures 1.2.5, 1.2.6, Table 1.2.2) test sites. In situ shear wave and compressional wave velocity were measured using ISSAMS and the Duomorph In situ Aquisition System (DIAS) (Figure 1.2.6), and bottom stereographs were obtained by divers for later analyses of bottom roughness. All of the gravity cores were logged for compressional wave velocity and wet bulk density

shortly after collection. Grain density, water content, void ratio, porosity, and grain size, and calcium carbonate content were measured on both gravity and diver cores. Fabric samples were collected for thin section, scanning electron, and transmission electron microscopy image analysis. In situ shear strength was measured using an in situ, diver-deployed, vane shear apparatus. The biogenic components of one representative core were identified / classified.

1.3 Lower Tampa Bay and Indian Rocks Beach

The Lower Tampa Bay (LTB) test site is located in the southernmost extent of Tampa Bay east of Egmont Key. Lower Tampa Bay test area is a muddy-siliciclastic sand in approximately 5 to 8 m water depth. The environment is low-energy, receiving little agitation except during storm events. Two sites were occupied west of Egmont Key in the Gulf of Mexico and five sites west of Egmont Key in Tampa Bay (Figure 1.3.1). Four diver cores were collected from each of the sites (Figure 1.3.2, Table 1.3.1) and in situ shear wave and compressional wave velocity were measured using ISSAMS. Diver cores were logged for compressional wave velocity and attenuation after temperature equilibration. The diver cores were sampled, and wet bulk density, grain density, water content, void ratio, porosity, and grain size were measured.

The Indian Rocks Beach (IRB) test site is located offshore from Indian Rocks Beach in the Gulf of Mexico (Figure 1.3.1). The IRB test site is a wave-dominated environment comprised of carbonate-siliciclastic sands in approximately seven meters water depth. Two locations were occupied in the IRB test site and four cores were collected from each location (Figure 1.3.2, Table 1.3.1). In situ shear wave and compressional wave velocity were measured using ISSAMS, and bottom stereophotographs were obtained by divers for later analyses of bottom roughness.

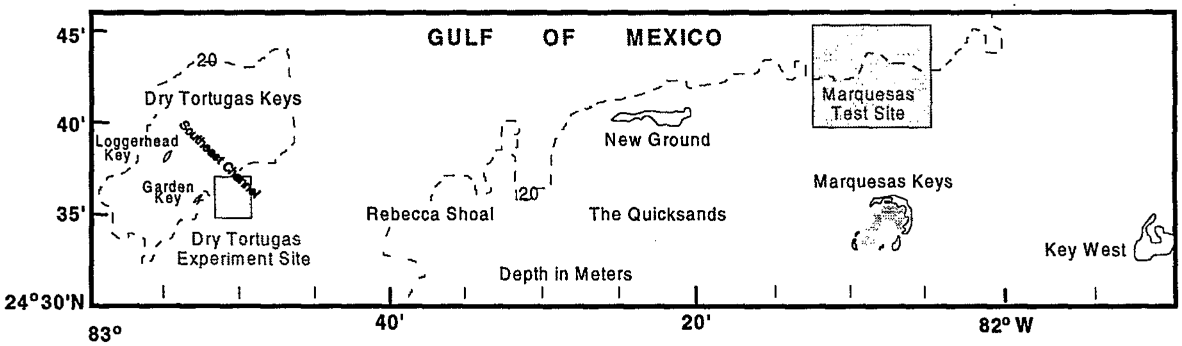


Figure 1.2.1 Dry Tortugas and Marquesas Keys test site location map.

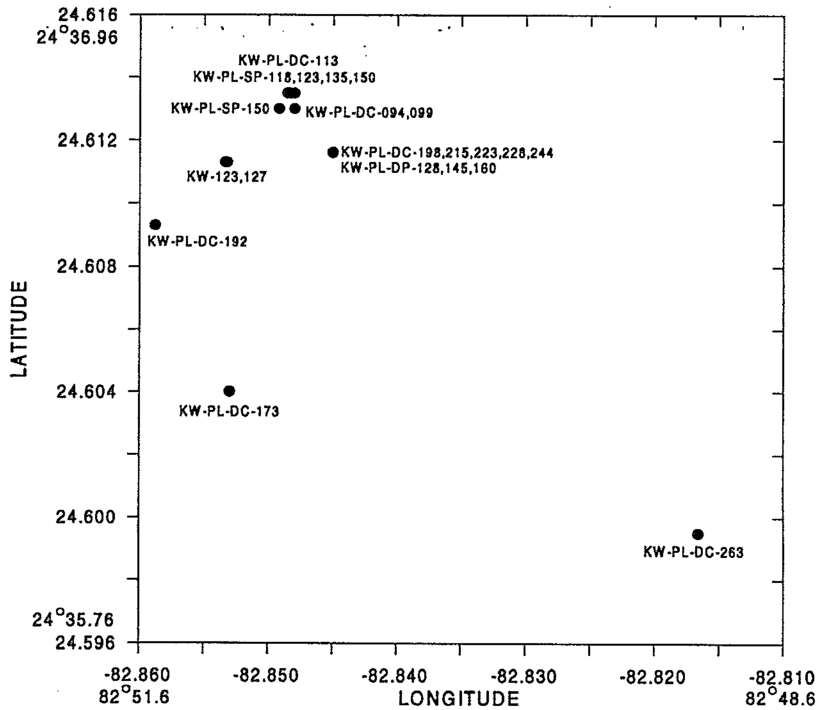


Figure 1.2.2 Dry Tortugas test site diver core and diver vane shear locations.

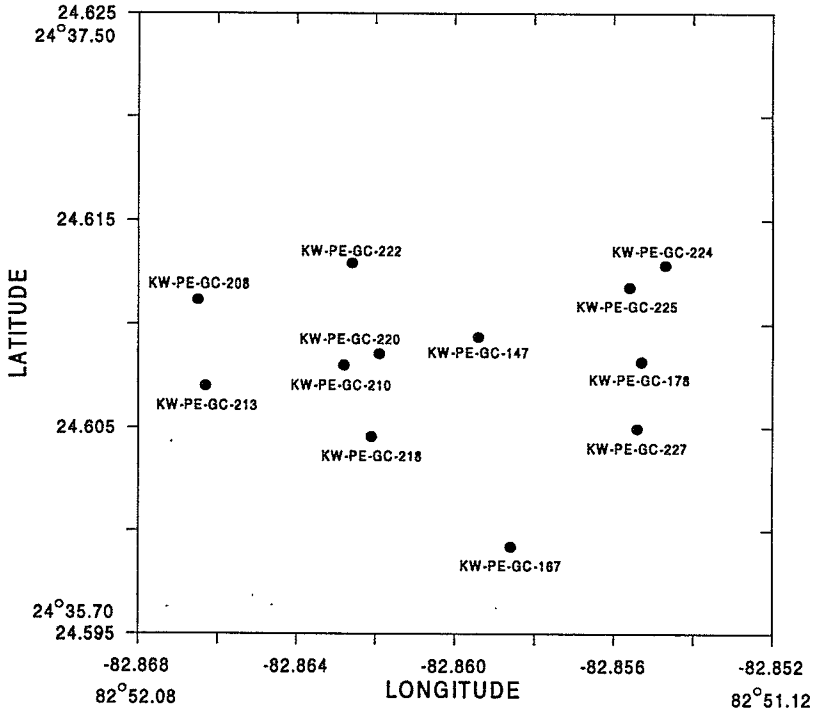


Figure 1.2.3 Dry Tortugas test site gravity core locations.

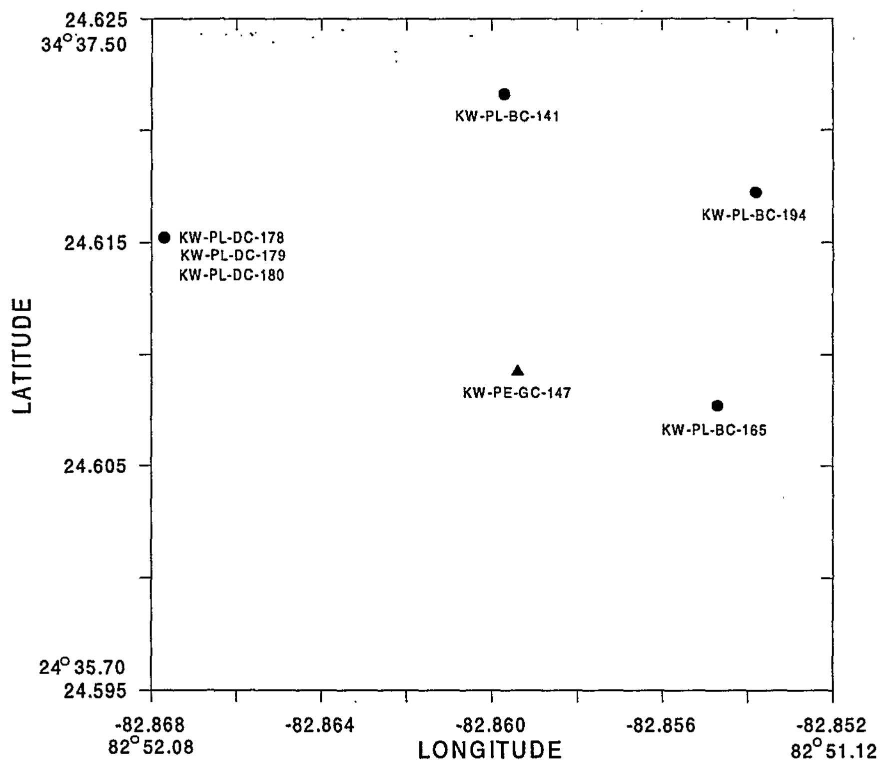


Figure 1.2.4 Dry Tortugas test site geochemistry and mineralogy cores.

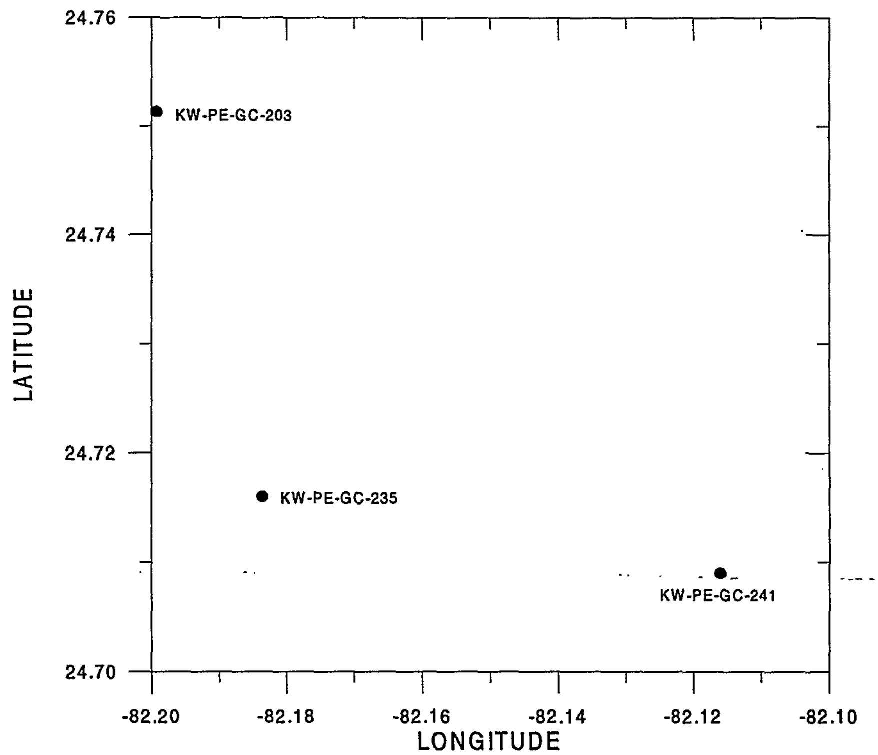


Figure 1.2.5 Marquesas Keys test site gravity core locations.

Table 1.2.1 Dry Tortugas test site gravity core locations.

Station	Latitude	Longitude
146	24.61	-82.86
147	24.61	-82.86
157	24.62	-82.86
158	24.62	-82.85
159	24.62	-82.85
167	24.60	-82.86
177	24.62	-82.86
178	24.61	-82.86
179	24.60	-82.85
180	24.61	-82.87
204	24.61	-82.85
206	24.62	-82.86
208	24.61	-82.87
209	24.61	-82.87
213	24.61	-82.87
214	24.60	-82.87
215	24.60	-82.87
218	24.60	-82.86
220	24.61	-82.86
222	24.61	-82.86
224	24.61	-82.85
225	24.61	-82.86
227	24.60	-82.86
229	24.60	-82.85
231	24.61	-82.85
233	24.60	-82.85
283	24.61	-82.85
313	24.61	-82.85

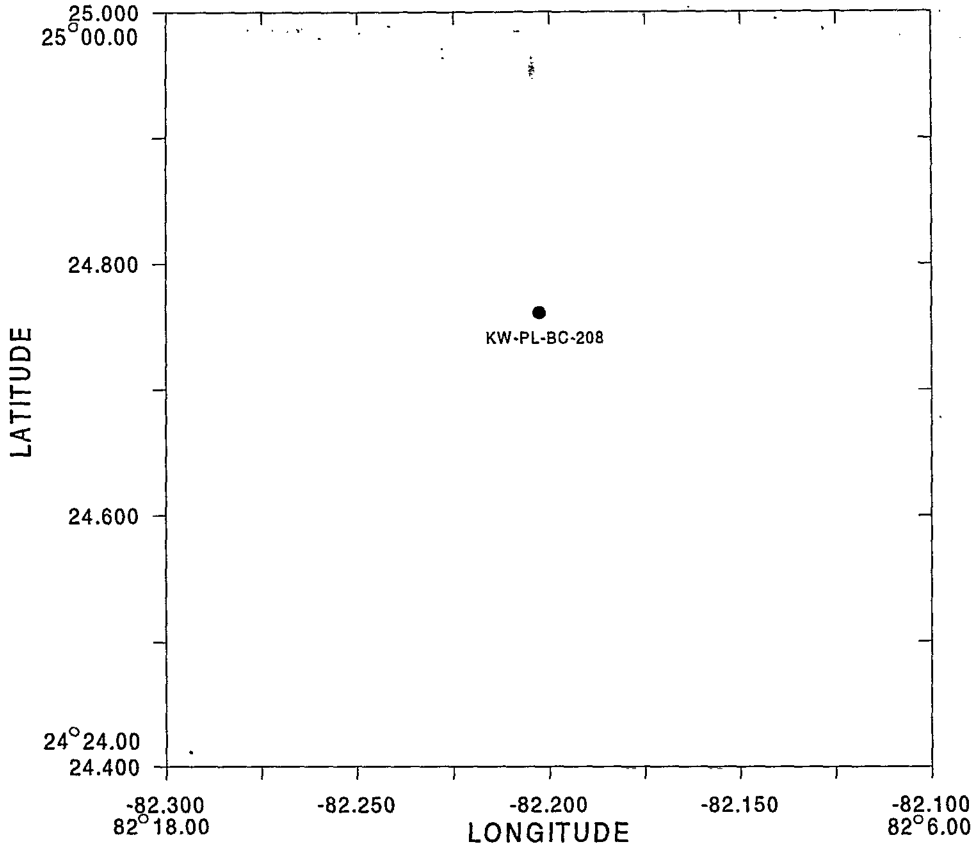


Figure 1.2.6 Marquesas Keys test site box core locations.

Table 1.2.2 Marquesas Keys test site gravity core locations.

Station	Latitude	Longitude
194	24.75	-82.20
203	24.75	-82.20
234	24.72	-82.18
235	24.72	-82.18
236	24.72	-82.18
237	24.72	-82.17
238	24.72	-82.15
239	24.72	-82.13
240	24.72	-82.12
241	24.71	-82.12
242	24.70	-82.18
285	24.71	-82.20
286	24.71	-82.20
287	24.71	-82.20
288	24.71	-82.17
289	24.71	-82.17
290	24.71	-82.17
291	24.71	-82.20
292	24.74	-82.20

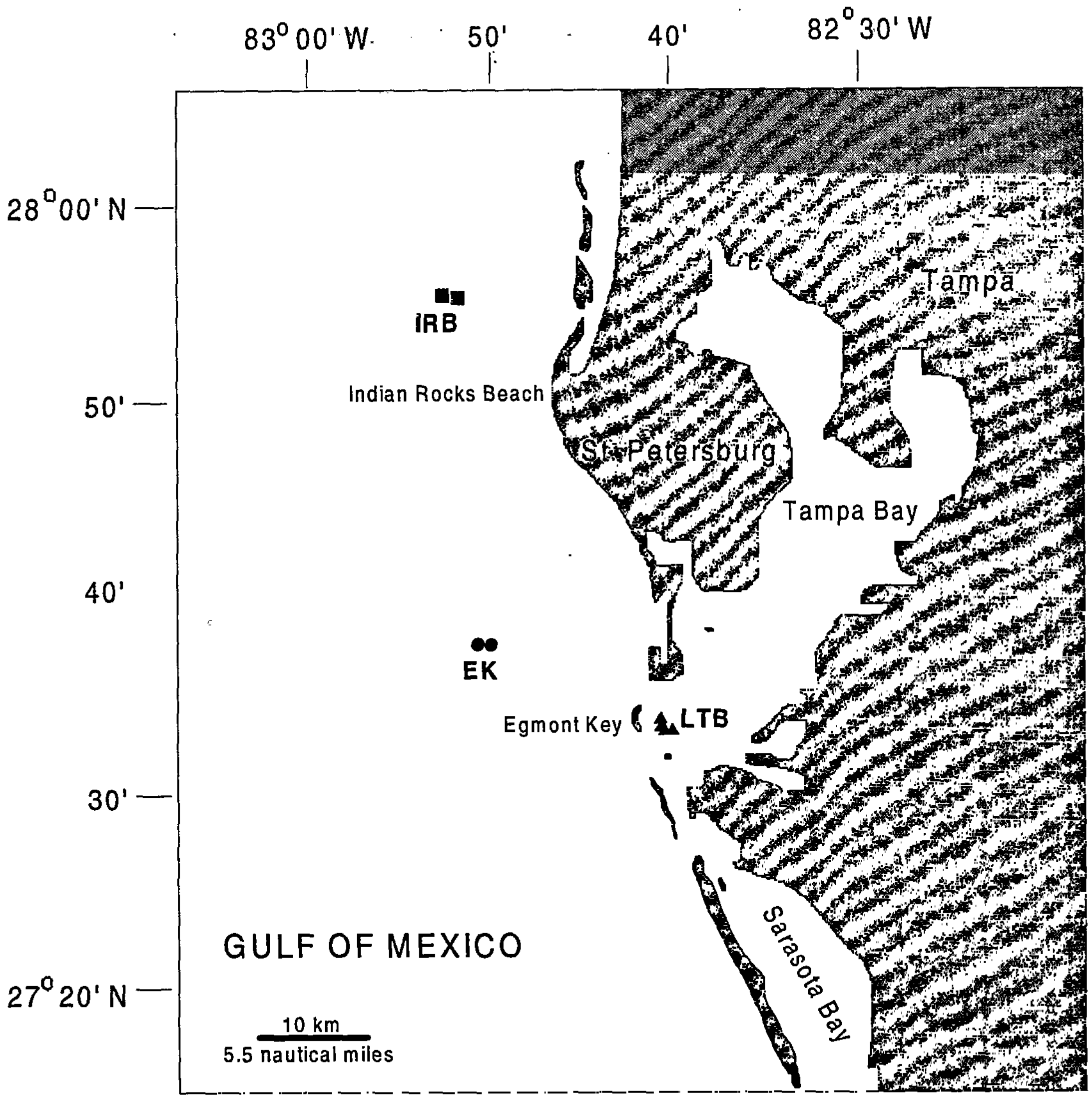


Figure 1.3.1 Lower Tampa Bay / Indian Rocks Beach test sites.

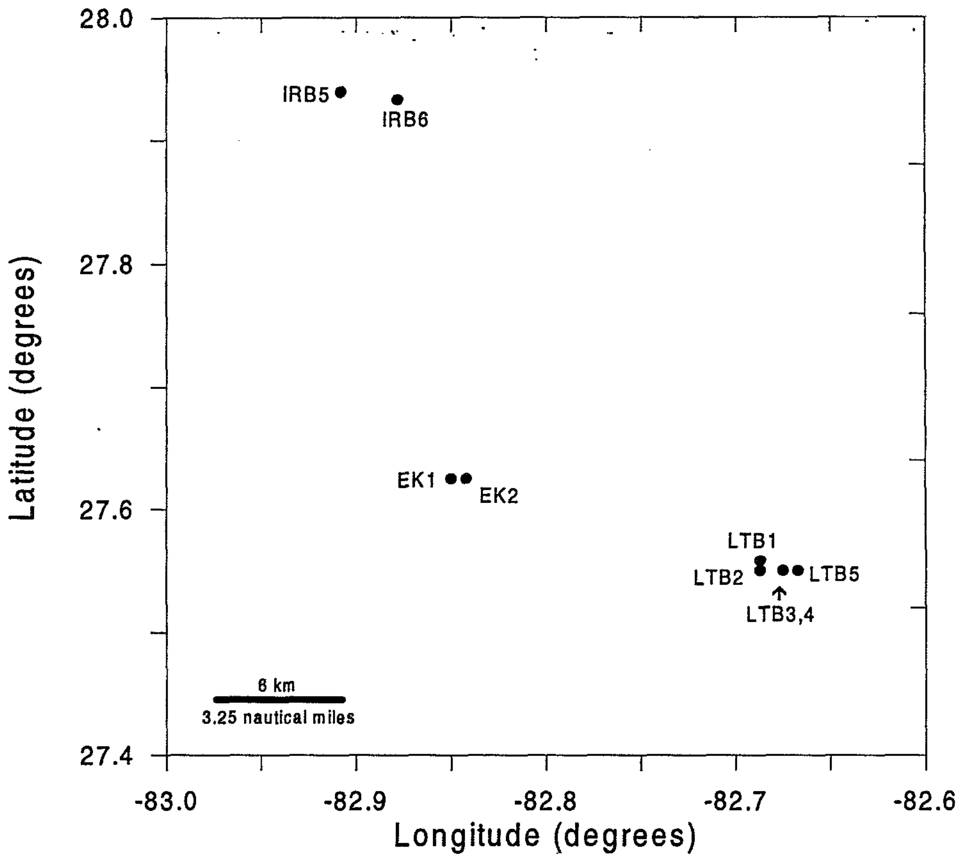


Figure 1.3.2 Lower Tampa Bay and Indian Rocks Beach station locations.

Table 1.3.1 Lower Tampa Bay and Indian Rocks Beach diver core locations.

Station	Latitude	Longitude	Depth (m)
EK1	27° 37.49' N	82° 51.00' W	8
EK2	27° 37.48' N	82° 50.50' W	7
IRB5	27° 55.96' N	82° 52.65' W	4
IRB6	27° 56.34' N	82° 54.47' W	7
LTB1	27° 33.50' N	82° 41.20' W	5
LTB2	27° 32.99' N	82° 41.20' W	5
LTB3	27° 33.00' N	82° 40.50' W	5
LTB4	27° 33.00' N	82° 40.00' W	5
LTB5	27° 32.99' N	82° 39.99' W	4

2.0 Materials and Methods

2.1 Diver Core Collection, Geoacoustic Measurements, Bottom Roughness Measurements, and In-Situ Shear Strength (Briggs)

2.1.1 Core Collection and Geoacoustic Measurements

Cores on which geoacoustic and physical property measurements were made on 6.1-cm diameter polycarbonate plastic cylindrical cores cut at 45-cm lengths. Each core was beveled at one end to facilitate manual penetration into the sediment. Cores were capped at both ends immediately upon collection (to retain the water overlying the sediment) and kept in an upright position during transport to the laboratory for analysis. Collection, measurement, and handling procedures were designed to minimize sampling disturbance and to maintain an intact sediment-water interface within the core samples. Compressional wave velocity and attenuation were measured in the laboratory at 400 kHz for 19 diver collected cores using a pulse technique (Richardson 1986; Richardson et al. 1986). Measurements were made at 1-cm intervals by transmitting the pulse through the core liner with oil-filled rubber transducer-receivers. Sediment compressional wave velocity was also expressed as the ratio of measured compressional wave velocity in sediment to measured compressional wave velocity in the overlying water in the core (V_p ratio). Sediment compressional wave attenuation measurements were calculated as in Richardson (1986) and expressed in units of dB m^{-1} kHz^{-1}; this corresponds to the constant *k* reported in tables in the Results (Hamilton 1972). Attenuation plotted in the Results are reported as dB m^{-1}.

2.1.2 Physical Property Measurements

Porosity was measured at 2-cm intervals on the same cores using weight loss from samples in a drying oven at 105°C for 24 h. Samples were cooled in a desiccator and reweighed. Average grain density was determined with a Penta-Pycnometer on selected samples. Porosity was calculated after Lambert and Bennett (1972). Values of porosity reported in tables and plotted in the Results were not corrected for pore water salinity. Salt-free porosity values may be calculated by multiplying reported values by 1.012. Sediment bulk density appearing in tables and plots in the Results was calculated from values of sediment porosity, water density, and average grain density (Briggs 1994). Void ratio (e) was calculated by dividing the porosity value by the difference between 100 and the porosity value.

Sediment grain size was determined at 2-cm intervals from disaggregated samples by dry sieving with a sieve shaker for gravel- and sand-sized particles and on separate, undried samples by use of a Micromeritics Model 5000 Sedigraph for silt- and clay-sized particles when samples were collected from muddy environments. Prior to size fractionation, sediment samples were soaked overnight in 200 ml of dispersant solution (2.5 g of sodium hexametaphosphate per liter of distilled water), then disaggregated by sonicating the sample with an ultrasonic disrupter for 12 min while stirring with a magnetic stirrer. The disaggregated sample was wet-sieved with dispersant through a 62-µm screen

to separate the sand-sized fraction from the silt- and clay-sized fraction. The finer fraction was collected in a 1000-ml graduated cylinder, and enough dispersant was added to fill the graduated cylinder to 1000 ml. The coarser fraction was rinsed off the screen into a beaker with distilled water and then dried.

The dried, coarser fraction was fractionated into quarter-phi intervals with a sieve shaker and each fraction was individually weighed to determine the gravel- and sand-sized particle distribution. Grain size is expressed as phi units (ϕ), or the negative of the base-two logarithm of the particle diameter in millimeters. The silt- and clay-sized fraction was thoroughly agitated by vigorous stirring and aeration. A 20-ml aliquot sample representative of the total distribution of particles in suspension was pipetted from the graduated cylinder and into a preweighed beaker, dried in an oven, and weighed. Fine particle fractionation for sediments with 5% or less estimated silt and clay by weight was accomplished by taking a 20-ml aliquot at the appropriate time and depth within the graduated cylinder prescribed by Folk (1965) for the silt-clay break (8 phi). Subtraction of the 8-phi weight from the total weight yielded the silt weight. The silt weight was separated into eight equal half-phi intervals and the clay weight was separated into six equal whole-phi intervals. For samples with significant (>5% by weight) fine particle fractions, the fines were allowed to settle for 5 days before 20-ml aliquot samples were pipetted from the appropriate depths in the cylinder and into preweighed beakers, dried, and weighed to estimate the weight of clay-sized particles in the 10 to 11, 11 to 12, and 12 to 14 phi intervals. At the conclusion of 6 days of settling, all particles 10 phi and coarser were near the bottom of the graduated cylinder. At this time, the supernatant was slowly siphoned into another graduated cylinder, leaving the settled particles and about 200 ml of dispersant and sample. The supernatant volume was recorded. A 20-ml aliquot sample was pipetted from the supernatant after agitation, dried, and weighed to estimate the weight of the remaining particles finer than 10 phi. Finally, the sample remaining in the graduated cylinder was sonicated and stirred for 12 min in a beaker prior to size determination with the Micromeritics Sedigraph. The Sedigraph determines the concentration of silt- and clay-sized particles in liquid suspension at various depths in a sample cell by means of a finely collimated, horizontal x-ray beam. The concentration was presented in the form of a cumulative "percent-finer-than" distribution trace in relation to the Stokesian diameter of the particles.

Grain size distributions were analyzed and plotted as weight percent histograms and cumulative weight percent for all phi sizes through 14 phi. The fraction finer than 12 phi was equally divided between the 12 to 13 phi and 13 to 14 phi intervals to reduce skewing effects of lumping all fines into one bin. The mean grain size and sorting coefficient were calculated according to the graphic formula of Folk and Ward (1957). Sediments were divided into size classes of gravel, sand, silt, and clay using the Wentworth scale. These statistics are reported in tables and histograms in the results.

2.1.3 Bottom Roughness Analysis

Stereo photographs of the sediment surface were made with a Photosea 2000 35-mm underwater stereo camera and a 100-Joule Photosea 1000 underwater strobe mounted in a molded fiberglass diver module. The diver module was mounted in a rigid 2.54-cm nominal diameter PVC frame to maintain constant focal distance and orientation with respect the bottom. Two Nikon 28-mm water-corrected lenses were separated by 61 mm in the Photosea stereo camera system, yielding a 57.2 x 65.9-cm overlap area at the 91-cm focal distance from the camera to the bottom. Orientation of the photographs was determined by photographing a diver's compass on the sea bottom as the first photograph of a photographic transect along a tape measure previously laid down on the sea floor by divers. Transects were followed for approximately 15 m.

All stereo photographs were recorded on 10-m strips of Kodak Ektachrome 64 film. The stereo photographs were processed as continuous rolls and examined for clarity and exhibition of representative features of the experiment site. Measurement of bottom roughness was accomplished with the photogrammetric analysis of stereo photographs by digitizing relative height measurements at regularly spaced intervals using a Benima (Hasselblad) AB photogrammetric stereocomparator. Photogrammetric software provided by Benima corrected the measurements for distortion caused by refraction in sea water and lens aberrations. Use of the stereocomparator allows high frequency sampling of bottom roughness with accuracy of nearly 0.1 mm. The relative orientation calculation in the photogrammetric software performed a *de facto* least-squares de-trending operation on the digitized height data. From each of the stereo photographs, three parallel, 53.34-cm-long relative height profiles were digitized in the same azimuthal orientation as the tape measure. RMS roughness values for each profile were calculated as the standard deviation of the relative height measurements.

From the height profiles, roughness power spectra are calculated and then smoothed by averaging in order to determine the slope and intercept of the regression which depicts the average decay of the roughness power spectrum for each site. The values for the slope and intercept are employed as parameters for models predicting acoustic backscatter strength from bottom roughness (in concert with the other measured sediment parameters).

2.1.4 Vane Shear Measurements

In-situ shear strength was measured with a diver-operated vane shear device with a vane blade 21.9 mm high by 21.9 mm in diameter. Torque was measured using a hand tool with a graduated torque scale and converted to shear strength using the assumptions and equation of Monney (1974). The component of the torque attributed to friction between the rod and the sediment was subtracted from the total measured torque before calculating the shear strength. The frictional component was determined by performing identical torque tests with a vaneless rod. Corrected shear strength values for each trial are reported in tabular form in the results.

2.2 Gravity Core Collection, Physical and Geoacoustic Property Measurements (Stephens and Lavoie)

Gravity cores were collected using an NRL hydroplastic gravity corer in February 1995 aboard the *R/V Pelican* in water depths of 25-30 m. The core pipe was 3-in diameter, schedule 40 PVC in 3.1 meter lengths. The gravity corer was lowered until the core cutter was 3 to 4 m from the sediment-water interface and then allowed to free-fall to the bottom. The recovered core was removed from the gravity corer, the excess pipe cut off, and the top plugged with styrofoam and sealed while still upright to preserve the top. The core ends were later sealed with paraffin wax to prevent loss of water.

The Dry Tortugas and Marquesas gravity and diver cores cores were logged for compressional wave velocity and wet bulk density using Texas A&M University's Schultheiss core logger (Boyce 1976). The compressional wave velocity transducers were calibrated to distilled water at 20°C and the gamma ray detectors were calibrated to aluminum rods. The cores were then either extruded or split and subsampled at 10-cm intervals for grain size and 2-cm intervals for grain densities, wet bulk densities, and calcium carbonate content.

Wet bulk densities and grain densities were measured using Quantachrome multi-pycnometer and ultrapycnometer-1000 helium gas pycnometers (Quantachrome 1995). The pycnometers were calibrated using stainless steel spheres and checked with Ottawa sand and powdered quartz crystal standards. Samples were dried at 105° C for 24 h prior to grain density measurements. Weights used in determining densities were measured with a Mettler AE160 balance. The densities are accurate to $\pm$ 0.005 g/cm^3 and are reported to two decimal places.

Porosity (n) and water content (w) were calculated from grain density, wet bulk density, and water density (1.024 g/cm^3) measurements. Void ratio (e) was calculated from porosity values.

$$n = (DG-\rho) / (DG-DW) * 100$$

$$w = (DW/DG) * e * 100$$

$$e = (n/100) / (1 - (n/100)),$$

where DG = grain density, DW = water density, and ρ = wet bulk density.

Values of porosity, water content, and void ratio are all reported to two decimal places. Calcium carbonate content (% carb.) was measured with a carbonate bomb and is also reported to two decimal places (Presley 1975).

Grain size was measured by the pipette method for silt- and clay-size particles and sieve method for gravel- and sand-size grains. The sand fraction was sieved at quarter phi intervals (-2φ to 4φ) and the silt/clay fraction measured at whole phi intervals (4φ to 9φ). The silt/clay boundary used was 8φ. Mean grain size (MGS) was calculated by Folk's Graphic Mean (Folk 1974).

2.3 DIAS (Lavoie)

2.3.1 DIAS Data Collection

DIAS is an alternate technology requiring a single duomorph probe for measuring shear modulus in situ. The DIAS system consists of a duomorph probe, bottomside electronics housed in a pressure canister, and topside electronics hardwired to the underwater portions of the system.

The duomorph probe is a bending plate device that is vibrated and the resulting deflections measured. The device consists of a stainless steel plate sandwiched between a pair of piezoceramic crystals with metallic strain gauges glued to the center of each crystal (Fig. 2.1). The piezoceramic crystals are low-power, electromechanical transducers capable of converting electrical energy to mechanical energy and vice versa. When stimulated by an alternating current, the duomorph vibrates in a parabolic fashion. The ratio between the unconstrained bending of the duomorph in air and the constrained bending in sediment is a function of the sediment dynamic modulus.

The data acquisition system consists of top-side electronics, bottom-side electronics, and probe electronics. The top-side electronics, a personal computer running custom-designed software, provides data storage, signal display, system control, and data analysis functions. Communications to the bottom-side electronics are provided by an RS-422 serial interface. 150VDC power is provided by a commercial switching DC power supply. A junction box interfaces the computer and power supply to the 100-m umbilical cable.

Bottom-side electronics include an IBM compatible, single-board computer that receives control information over the RS-422 bus and performs the requested operations, a 12-bit A/D board, a programmable function generator, and a custom built amplifier. Generally, the probe is driven by a 40-V peak-to-peak 250-Hz sine wave. The frequency is chosen to stay below probe resonance and the amplitude is chosen as a tradeoff between overdriving the ceramic, which causes decoupling with the sediment and signal digitization resolution.

The DIAS system was used to measure in situ shear modulus in the Dry Tortugas and Marquesas sediments with the aid of divers pushing them to the required depths. The probes were allowed to equilibrate before measurements were recorded. Shear wave velocity was calculated using measured bulk density.

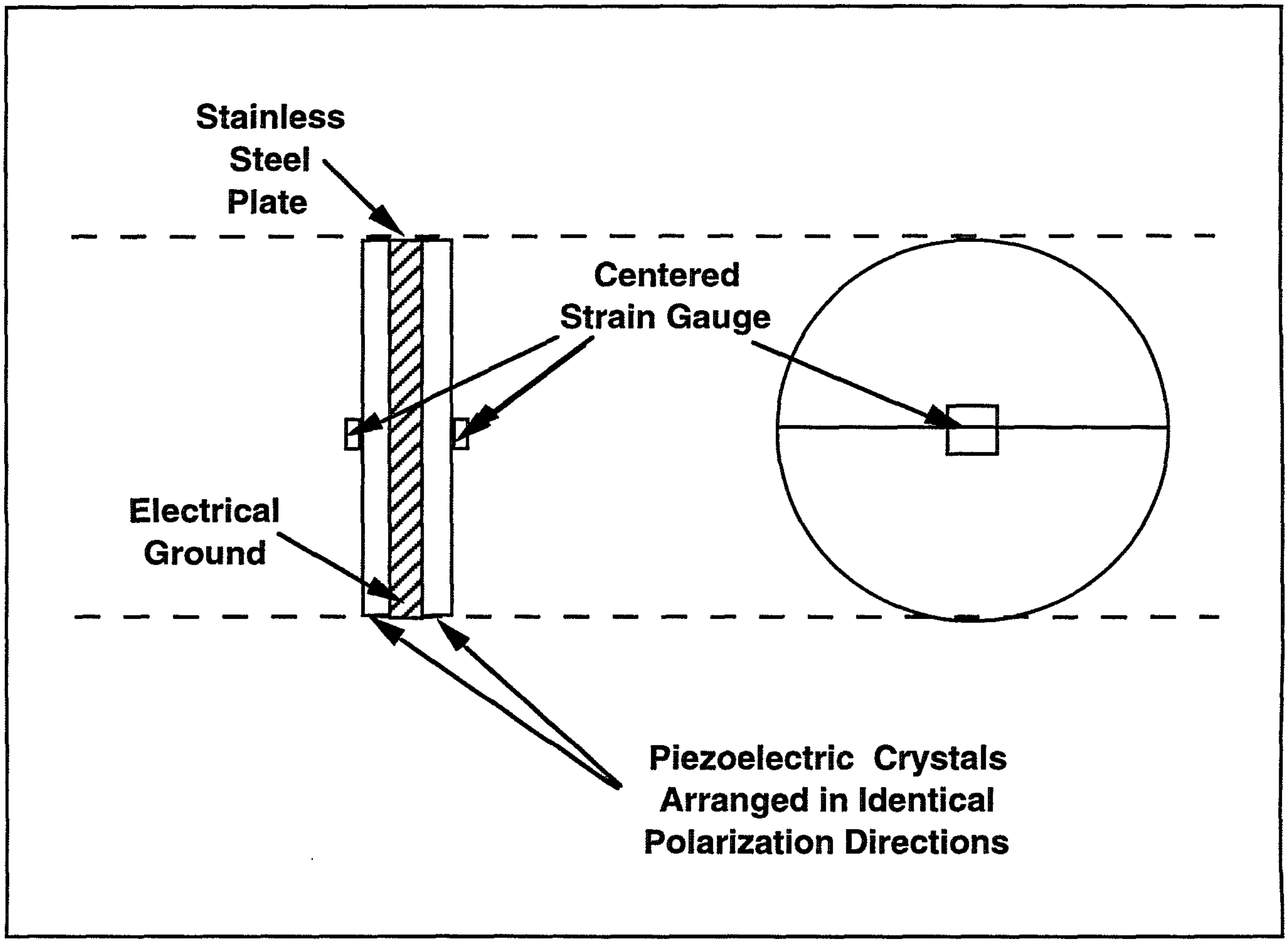


Figure 2.1. Schematic diagram of the duomorph sandwich. The piezoceramic crystals are arranged with the polarities in the same direction. Strain gauges are centered on each crystal. The sandwich is excited with an alternating current which results in the parabolic vibration of the duomorph sandwich. The amplitude of the deflection is measured using the strain gauges.

2.3.2 Data Reduction

The methods used to reduce the sampled data are outlined below:

1. Phase and amplitude of the input and output voltages are measured by exciting the potted duomorph in air.

2. The amplitude of the in situ wave forms are directly proportional to the voltage; the displayed wave form on the computer represents the amount of dynamic strain detected by the strain gauges. The ratio of the voltage in the air to the sediment was used in the following equation to determine the modified moment ratio:

$$\left|\frac{Mc}{Mo}\right| = \frac{(es/ea) - k}{1 - k} \quad ,$$

where

es is the voltage (strain) in sediment under a load,
ea is the voltage (strain) in air, and
k is the electromechanical coupling coefficient, a measure of the piezoelectric effect. It is a constant dependent on disk design (for the duomorph with a 0.008-cm steel plate, k = -0.664) (Briar et al. 1976).

$$\frac{1}{k} = 1 - \frac{3\beta\, hz(hz + t)(2 + Es\ t/Ez\ hz)}{h^2\left[1 + (Es/Ez - 1)(t/h)^3\right]} \quad ,$$

where

$\beta = 0.5\ (1 + hm/hz) = 0.86364$,
hz = thickness of the piezoceramic crystal,
t = height of the duomorph overall,
Es = Young's modulus of steel plate, and
Ez = Young's modulus of the piezoceramic crystal.

The modified moment ratio, $\left|\frac{MC}{MO}\right|$, is a complex value having both magnitude and phase. A nomograph has been constructed that is essentially two curves sharing a common independent axis M' for each value of the independent variable, tan ϕ. This allows us to quickly find values of M' and tan ϕ used in the calculation of the sediment elastic modulus, E'.

$$E' = \frac{M' D}{a^3},$$

where a is the radius of the duomorph and D is the disk flexural rigidity.

Shear modulus, G, and shear wave velocity, Vs, are determined as follows:

$$E'' = E' \tan \phi$$

$$E^* = \sqrt{E' + E''}$$

$$G = \frac{E^*}{2(1+\nu)} \quad \text{(from Hamilton 1971),}$$

ν is Poisson's ratio and is estimated to be ~0.48 for Key West samples.

$$Vs = \sqrt{\frac{G}{\rho}} \ ,$$

where ρ is the measured density.

2.4 Microfabric

Microfabric samples were collected from diver cores from Boca Raton and from both gravity and diver cores from the Dry Tortugas and Marquesas Keys. Samples were collected by subsampling cores with a 60 cc syringe which was beveled at the end to minimize disturbance of the fabric. The samples were then allowed to air dry in a dessicator for approximately two weeks. Samples were impregnated with Spurr (Spurr, 1969) epoxy resin and cured at 70°C for at least 8 hours. Thin sections and polished SEM stubs were made by Quality Thin Sections in Tuscon, Arizona. Thin sections were photographed at the University of New Orleans, Department of Geology and Geophysics' petrographic microscope. SEM samples were examined using the University of New Orleans, Department of Geology and Geophysics', Amray model 1420 SEM. Samples were photographed with a 15 kV accelaeration potential and 100 μm final apperture in backscatterd electron mode. Samples for electron microscopy were also embedded in Spurr epoxy, ultra-thinsectioned with a Dupont Sorvall MT2-B Ultra Microtome, and photographed using a Naval Research Laboratory Hitachi H-600 transmission electron microscope.

Image Analysis was performed on BR samples to determine interparticle porosity of BR sediments with Image-1 image analysis software for measures of geometric and geomorphic features of particles.

2.5 Mollusc Identifications (Stephens)

Gravity core KW-PE-GC-157 was extruded and sampled at 2 cm intervals and then wet sieved through a 0.5 mm sieve. The > 0.5 mm fraction was oven dried at 105°C. Intact mollusc shells were identified to species level.

2.6 In-Situ Geoacoustic Measurements (Richardson)

In-situ measurements of sediment geoacoustic properties (compressional wave velocity and attenuation and shear wave velocity) were made with three systems: In Situ Sediment Acoustic Measurement System (ISSAMS), operated from aboard ship for measurement of surficial geoacoustic properties; and two diver-operated systems designed to measure gradients of shear wave velocity Gradient In Situ Sediment Acoustic Measurement System (GISSAMS) and compressional wave velocity and attenuation (Neptune). The operation of each is briefly described below, followed by a description of sampling locations occupied in the carbonate sediments of the Florida Keys. Data are presented in tabular form as well as on maps of the areal distribution of values of geoacoustic properties and plots of the vertical gradients of shear and compressional wave velocity.

2.6.1 ISSAMS: In-Situ Sediment Acoustic Measurement System

ISSAMS Mechanical Description: ISSAMS is an aluminum and stainless steel structure used to hydraulically deploy geoacoustic and geotechnical measurement probes in coastal marine sediments (Richardson et al. 1994; Griffin et al. 1996). The large size (3 m high, 2 m square footprint) and weight (approximately 1 metric ton) are required to make measurements over the variety of sediments found in coastal marine waters. The outer frame acts as a guide for a hydraulically driven inner frame to which four compressional and four shear wave probes are mounted. The inner frame has a 60-cm stroke allowing the probes to be completely drawn into the protective outer frame at any time during deployment. Once the ISSAMS is placed on the seafloor, probes are pushed into the sediment at depths ranging between 0 to 50 cm. This allows for gradient measurements to be obtained. The inner frame allows for probe mounting separations of 40 to 110 cm. Around the entire base of the structure is a 30-cm-wide plate that serves a dual purpose. When ISSAMS is deployed on a soft mud, this plate increases the surface area to better distribute weight and keep ISSAMS from sinking into the sediment. On hard packed sands, however, the plate serves as a surface for attachment of additional weight to help insert the eight geoacoustic probes into the sediment.

ISSAMS Electronics: ISSAMS electronics consists of both top-side and bottom-side electronic suites connected by a single, electromechanical coaxial cable. The top-side system provides remote control, system power, storage, and display. An IBM-compatible computer system provides control, display, signal analysis, and storage. Standard NTSC color television and VCR are used to display and store real-time video of the deployment of the system and movement of the probes into the sediment. A

commercially available 20-amp, 200 VDC switching power supply is used to provide 150 VDC power to the bottom-side electronics. The only custom components are a low-pass filter to reduce power supply switching noise and an interface box that combines/separates data, video, and 150 VDC power. The interface box accepts filtered 150 VDC power and an RS-422 data stream from the top-side computer, converts the RS-422 to FSK, and then combines the two signals. Output from the interface box is RS-422 data converted from the bottom-side FSK signal and NTSC video on a 64 MHz carrier (channel 3). A custom-written software program integrates the system operation.

The ISSAMS bottom-side electronics consist of a hydraulic power pack, bottom-side interface electronics, Seabird CTD, black-and-white camera, color camera, a 24 VDC sea battery, computer system, and power amplifier. Most bottom-side electronics are housed in four pressure canisters. The sea battery, the CTD, and the cameras are separate, commercially available units for which interfaces have been developed. The hydraulic power pack consists of a 24-VDC-powered hydraulic motor located in a pressure canister. Control commands from the topside are received by the bottom-side computer, which controls the hydraulic motor. Position feedback information is provided by a potentiometer built into the hydraulic cylinder. Limit switches are located at the top and bottom stroke of the inner frame to stop the frame from moving past preset positions. An additional feature of the hydraulics system is automatic retraction of the probes from sediment if the 150 VDC top-side power is lost. This is a safety mechanism to protect the probes from being destroyed if an electronics failure occurs when the probes are in the sediment. Power to run the hydraulic motor is provided by the sea battery.

The interface electronics canister contains of an assortment of electronics including an FSK modem, hydraulic control relays, DC-DC power converters, video amplifiers, and video modulators. The FSK modem converts the RS-422 data from the bottom-side computer to an FSK signal and converts the FSK signal from the top-side computer to an RS-422 data stream that the bottom-side computer accepts. The DC-DC power converters reduce the 150 VDC to the various DC voltages required by the bottom-side electronics. The hydraulic control relays perform the hydraulic control discussed in the above paragraph. These are not included in the cylinder with the hydraulic motor due to the flammable nature of the hydraulic fluid. Lastly, the video modulators and video amplifiers condition the signals from the cameras for transmission to the topside. Control circuitry selects the desired camera, since the color camera is pointed downward to provide a view of the sediment, and the black-and-white camera is directed horizontally to provide a view of probe position.

The amplifier electronics are housed in a separate canister. Programmable gain amplifiers (0 - 60 dB) are used to amplify the probe received signals. This is in addition to the 40 dB of gain that each probe's preamplifier provides. Transmit probes are driven by a 350-watt power amplifier. These amplifiers are conduction-cooled to prevent thermal damage.

The bottom-side digital electronics system controls the functionality of ISSAMS. This unit contains a function generator, two 12-bit, 1 Msample/s A/Ds, one low-speed, 12-bit A/D, a parallel I/O card, and an IBM-PC-compatible computer system. The software running on this computer can control the pulse length, frequency, and amplitude of the transmitted shear or compressional wave signals. Signals from 20 Hz to 100 kHz are synthesized by the function generator. The receive sample rate can be adjusted from 1 ksample/s to 1 Msample/s. The high-speed A/Ds are simultaneously triggered with the function generator to provide an accurate signal velocity measurement. RS-232 serial communications are used to collect data from the CTD. The parallel I/O and low-speed A/D are used to provide feedback and control of the ISSAMS subsystems.

ISSAMS Probes: ISSAMS uses a single radial-poled ceramic element in each of the four compressional wave probes. The compressional wave probes have a modular design that allows for easy repair and for use of probe tips made of different materials. The current probes have a resonant frequency of 38 kHz, which is the frequency that most measurements are made. Both transmit and receive compressional wave probes are identical except for a 40-dB gain preamplifier in the receive probes.

The shear wave probes used on ISSAMS are single, bimorph bender elements potted in a stainless steel frame with soft urethane. A thin, higher derometer polyurethane is used as a resilient outer coating to protect the ceramic during insertion. Transmit and receive shear wave probes are identical except for a 40-dB gain preamp located in the receive probes. Frequencies from 70 Hz to 2 kHz are used to make measurements with these probes. The shear probes are mounted to the ISSAMS frame using a neoprene-filled mount to reduce mechanical coupling between transmit and receive shear wave probes.

2.6.2 GISSAMS: Gradient In-Situ Sediment Acoustic Measurement System

Gradients of sediment shear wave velocity were measured using a pulse technique and probes similar to those employed by ISSAMS (Richardson et al. 1991). Transmit and receive probes are constructed of identical 31.75-mm square x 0.48-mm thick bimorph ceramic benders. The ceramics are potted in a stainless steel ring with soft silicone rubber (hardness = 35 shore A) to allow relatively unrestricted bender movement. A thin covering of much harder polyurethane resin (hardness = 80 shore A) holds the ceramics in place and provides a tough coating to protect the ceramics during insertion into the sediment. Shear wave probes are attached to the ends of 2.4-m hollow steel pipes and, during deployment probe orientation and distance below the sediment-water interface, are controlled by scuba divers using a PVC frame. Shear wave velocity was measured at 10-cm depth intervals and over 30- and 70-cm pathlengths parallel to the sediment-water interface. Shear waves are generated as a 2-6-cycle sine wave pulsed every 0.5 s. Driving frequency (70-1000 Hz) and driving voltage (100-230 V p-p) depends on the varying mechanical load of sediments on the compliant bender ceramic face, sediment shear wave velocity and attenuation, and the pathlength between receive and transmit probes.

Received signals are amplified with 40-dB preamplifiers mounted in receiver probe heads, bandpass filtered, and recorded with a digital waveform recording oscilloscope. Shear wave velocity is calculated from the measured time delay and known receiver-transmitter separation.

2.6.3 Neptune

Gradients of compressional wave velocity and attenuation were determined using a diver-operated probe system. Neptune uses compressional wave probes identical those of ISSAMS. The probes are attached to ends of a 3-m long, stainless steel, hollow pole. Probe distance is maintained at 50 cm by a stainless steel frame. Compressional wave velocity and attenuation were measured at 10-cm intervals using a pulse technique subsequent to the divers pounding the probes into the sediment. Driving frequency (38 kHz) and driving voltage (100 V p-p) are similar to those used with ISSAMS.

2.7 Geochemical and Mineralogical Measurements (Furukawa)

2.7.1 Sediment Chemistry Measurements

Pore water chemistry was studied on selected box cores (KW-PL-BC-141, 165, 194, 208) and diver cores (KW-PL-DC-179, 180) taken on board the *WFS Planet*. Pore water samples were collected using a Jahnke-type pore water squeezer (Jahnke 1988) that prevented sample exposure to air and subsequent oxidation. All core locations are indicated in the Results.

Pore water samples were analyzed for intermediate inorganic sulfur species and total inorganic reduced sulfur species using iodometric titration (Grasshoff 1983; Fonselius 1983) within 10 min of sampling completion. Major and minor cation concentrations were determined using inductively coupled plasma spectroscopy (ICP) by Chuck Holmes at the USGS Denver office. Pore water samples were also analyzed for pH within 10 min of sampling.

Total organic carbon content (TOC) was analyzed for samples from box core KW-PL-BC-194. After the pore water was extracted, sediment samples were extruded, placed in zipper-sealed plastic bags, and stored in a freezer. The frozen samples were later analyzed for TOC at a commercial laboratory.

2.7.2 Mineralogy Analysis

Bulk mineralogy was studied on the same selected cores mentioned above (KW-PL-BC-141, 165, 194, 208; KW-PL-DC-179, 180). Each sediment sample was air-dried,

ground using agate mortar and pestle, and mounted into the cavity of an aluminum sample holder for x-ray powder diffraction.

Gravity core samples from KW-PE-GC-147 were first separated into clay, silt, sand, and gravel-sized fractions using settling and siphoning, and each was prepared for x-ray diffraction. X-ray diffraction data of the size-fractioned samples from the gravity core were used to conduct the Rietveld crystal structure refinement to quantify the relative amount of high-Mg calcite (HMC) and low-Mg calcite (LMC), as well as to determine the Mg contents of HMC. The Rietveld analysis was conducted using a Rietveld program DBWS9411 (Young et al. 1994).

2.8 Stratigraphic Units

The sediments and underlying bedrock in the Dry Tortugas experiment site were divided into five distinct stratigraphic units; A, B, C, D, and the Key Largo Limestone. The units were divided on the basis of grain size, porosity, and color.

3.0 Results

3.1 Diver Cores, Physical and Geoacoustic Property Measurements, Bottom Roughness Measurements, and In-Situ Shear Strength (Briggs)

Section 3.1.1 includes geoacoustic data measured on the diver cores. The section is subdivided into two components. Subsection 3.1.1.1 contains geoacoustic data from the Boca Raton cores while section 3.1.1.2 contains geoacoustic data from Lower Tampa Bay and Indian Rocks Beach cores.

Section 3.1.2 contains physical, geoacoustic, and geotechnical property data. The section is divided into two subsections containing physical and geoacoustic property data, 3.1.2.1, and in-situ shear strength, 3.1.2.2.

Section 3.1.3 which includes the roughness power spectra estimated from the digitized height profiles from each pair of stereo photographs is divided into three sub-sections. The first, 3.1.3.1 consists of roughness power spectra from Boca Raton. The second, 3.1.3.2 consists of roughness power spectra from the Dry Tortugas. Finally, the third, 3.1.3.3 consists of roughness power spectra from Indian Rocks Beach.

Section 3.1.4 includes in situ shear strength data from the Dry Tortugas test site.

3.1.1 Geoacoustic Measurements

3.1.1.1 Boca Raton Diver Cores:

NS01-1
NS01-2
NS01-3
NS01-4
NS02-1
NS02-2
NS02-3
NS02-4
NS03-1
NS03-2
NS03-3
NS03-4
NS04-1
NS04-2
NS04-3
NS04-4
NS05-1
NS05-2
NS05-3
NS05-4
NS06-1
NS06-2
NS06-3
NS06-4
NS07-1
NS07-2
NS07-3
NS07-4

Cruise: Suncoaster Station: NS01-1 date: 9 Nov 94
lat: 26-19.57 N long: 80-03.62 W depth: 22 m

calc for: 27.0 deg C 36.0 o/oo 22.0 m 400 kHz
ref core: 25.5 deg C 79.88 delta-t 393.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.0	0.998	21.9	0.055
0	1542.2	1.002	146.6	0.367
1	1544.9	1.004	448.5	1.121
2	1568.7	1.019	613.2	1.533
3	1549.6	1.007	589.9	1.475
4	1642.1	1.067	589.9	1.475
5	1637.2	1.063	558.2	1.396
6	1646.0	1.069	491.2	1.228
7	1659.9	1.078	484.2	1.211
8	1658.5	1.077	506.3	1.266
9	1655.9	1.076	552.5	1.381
10	1652.3	1.073	597.2	1.493
11	1672.2	1.086	482.6	1.207
12	1681.8	1.092	413.6	1.034
13	1683.7	1.094	415.7	1.039
14	1689.7	1.098	409.7	1.024
15	1683.7	1.094	343.4	0.858
16	1696.8	1.102	343.4	0.858
17	1706.2	1.108	325.6	0.814

Cruise: Suncoaster Station: NS01-2 date: 9 Nov 94
lat: 26 19.57 N long: 80 03.62 W depth: 22 m

calc for: 27.0 deg C 36.0 o/oo 22.0 m 400 kHz
ref core: 25.5 deg C 79.88 delta-t 393.8 H 1.000 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.8	0.998	981.4	2.453
0	1540.6	1.001	1043.1	2.608
1	1553.6	1.009	1381.4	3.453
2	1577.6	1.025	1506.6	3.767
3	1576.0	1.024	1477.2	3.693
4	1536.4	0.998	1584.2	3.961
11	1628.1	1.058	1611.2	4.028
13	1677.2	1.089	1523.2	3.808

Cruise: Suncoaster   Station: NS01-3   date: 9 Nov 94
lat: 26 19.57 N   long: 80 03.62 W   depth: 22 m

calc for: 27.0 deg C   36.0 o/oo   22.0 m   400 kHz
ref core: 25.0 deg C   79.88 delta-t   387.5 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.999	-2.3	-0.006
0	1544.5	1.003	81.4	0.204
1	1675.2	1.088	225.2	0.563
2	1689.5	1.097	204.5	0.511
3	1703.2	1.106	255.6	0.639
4	1707.5	1.109	300.7	0.752
5	1714.2	1.113	319.0	0.797
6	1712.2	1.112	271.7	0.679
7	1711.3	1.112	241.1	0.603
8	1711.8	1.112	222.4	0.556
9	1710.3	1.111	209.4	0.523
10	1710.3	1.111	209.4	0.523
11	1703.7	1.107	204.5	0.511
12	1703.2	1.106	199.7	0.499
13	1703.7	1.107	204.5	0.511
14	1704.1	1.107	199.7	0.499
15	1702.2	1.106	197.4	0.493
16	1697.5	1.103	202.1	0.505
17	1691.4	1.099	252.8	0.632

Cruise: Suncoaster   Station: NS01-4   date: 9 Nov 94
lat: 26 19.57 N   long: 80 03.62 W   depth: 22 m

calc for: 27.0 deg C   36.0 o/oo   22.0 m   400 kHz
ref core: 25.0 deg C   79.89 delta-t   393.8 H   0.001 V/D
smp core: 36.0 o/oo   6.0 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.5	0.999	0.0	0.000
0	1543.2	1.002	73.1	0.183
1	1671.1	1.085	317.6	0.794
2	1693.2	1.100	237.3	0.593
3	1698.0	1.103	209.8	0.525
4	1701.4	1.105	220.0	0.550
5	1699.9	1.104	245.8	0.614
6	1701.3	1.105	239.7	0.599
7	1696.5	1.102	228.1	0.570
8	1694.6	1.101	228.1	0.570
9	1686.1	1.095	242.7	0.607
10	1692.2	1.099	263.1	0.658
11	1705.7	1.108	240.9	0.602
12	1707.1	1.109	214.8	0.537
13	1711.5	1.112	217.4	0.543
14	1450.9	0.942	1862.0	4.655
15	1703.2	1.106	411.7	1.029
16	1694.6	1.101	672.6	1.682
17	1694.6	1.101	588.5	1.471
18	1691.8	1.099	598.8	1.497

Cruise: Suncoaster **Station: NS02-1** **date: 10 Nov 94**
lat: 26-19.63 N **long: 80-03.82 W** **depth: 17.5 m**

calc for: 27.0 deg C **36.0 o/oo** **17.5 m** **400 kHz**
ref core: 24.5 deg C **79.93 delta-t** **381.2 H** **0.001 V/D**
smp core: 36.0 o/oo **6.1 cm thickness**

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.7	0.998	-4.6	-0.011
0	1646.2	1.069	125.6	0.314
1	1752.2	1.138	145.2	0.363
2	1756.2	1.141	145.2	0.363
3	1763.3	1.145	186.2	0.465
4	1771.5	1.151	125.6	0.314
5	1764.8	1.146	120.1	0.300
6	1768.4	1.149	134.3	0.336
7	1774.5	1.153	126.6	0.316
8	1775.6	1.153	129.9	0.325
9	1777.1	1.154	135.8	0.340
10	1777.6	1.155	138.9	0.347
11	1771.5	1.151	137.3	0.343
12	1772.0	1.151	146.8	0.367
13	1772.5	1.151	143.6	0.359
14	1770.4	1.150	145.2	0.363
15	1765.8	1.147	143.6	0.359
16	1749.7	1.137	129.9	0.325
17	1741.2	1.131	127.0	0.318
18	1738.3	1.129	121.4	0.304
19	1739.2	1.130	160.6	0.401
20	1735.8	1.128	184.0	0.460
21	1747.2	1.135	204.6	0.511

Cruise: Suncoaster Station: NS02-2 date: 10 Nov 94
lat: 26 19.63 N long: 80 03.82 W depth: 17.5 m

calc for: 27.0 deg C 36.0 o/oo 17.5 m 400 kHz
ref core: 24.5 deg C 79.91 delta-t 387.5 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.9	0.998	1.2	0.003
0	1756.7	1.141	289.8	0.724
1	1735.3	1.127	141.2	0.353
2	1745.2	1.134	139.7	0.349
3	1758.2	1.142	147.5	0.369
4	1751.2	1.138	202.1	0.505
5	1762.3	1.145	199.7	0.499
6	1760.3	1.143	166.5	0.416
7	1761.8	1.144	176.1	0.440
8	1761.3	1.144	184.2	0.461
9	1765.8	1.147	182.2	0.455
10	1765.3	1.147	152.5	0.381
11	1763.3	1.145	138.1	0.345
12	1759.8	1.143	164.7	0.412
13	1757.7	1.142	168.4	0.421
14	1763.3	1.145	182.2	0.455
15	1752.7	1.139	209.4	0.523
16	1757.7	1.142	180.1	0.450
17	1762.3	1.145	174.1	0.435
18	1753.7	1.139	159.3	0.398
19	1756.2	1.141	157.6	0.394

Cruise: Suncoaster Station: NS02-3 date: 10 Nov 94
lat: 26 19.63 N long: 80 03.82 W depth: 17.5 m

calc for: 27.0 deg C 36.0 o/oo 17.5 m 400 kHz
ref core: 25.0 deg C 79.91 delta-t 368.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.3	0.997	-11.6	-0.029
0	1760.2	1.143	192.7	0.482
1	1745.2	1.134	125.1	0.313
2	1755.7	1.140	116.7	0.292
3	1754.2	1.139	93.9	0.235
4	1752.2	1.138	96.6	0.241
5	1755.7	1.140	122.3	0.306
6	1750.7	1.137	140.5	0.351
7	1748.2	1.136	167.1	0.418
8	1738.7	1.129	188.1	0.470
9	1730.8	1.124	229.8	0.574
10	1720.1	1.117	402.2	1.005
11	1730.4	1.124	493.0	1.233
12	1719.7	1.117	417.2	1.043
13	1698.2	1.103	444.6	1.111
14	1695.8	1.102	496.9	1.242

Cruise: Suncoaster Station: NS02-4 date: 10 Nov 94
lat: 26 19.63 N long: 80 03.82 W depth: 17.5 m

calc for: 27.0 deg C 36.0 o/oo 17.5 m 400 kHz
ref core: 25.0 deg C 79.90 delta-t 393.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.7	0.998	21.9	0.055
0	1645.0	1.069	140.4	0.351
1	1754.0	1.139	184.4	0.461
2	1751.0	1.137	149.8	0.375
3	1754.0	1.139	137.4	0.344
4	1757.5	1.142	130.2	0.325
5	1758.5	1.142	123.3	0.308
6	1765.1	1.147	123.3	0.308
7	1763.1	1.145	133.0	0.333
8	1762.1	1.145	128.8	0.322
9	1763.1	1.145	124.7	0.312
10	1760.0	1.143	124.7	0.312
11	1759.5	1.143	135.9	0.340
12	1758.5	1.142	149.8	0.375
13	1761.5	1.144	168.8	0.422
14	1755.5	1.140	153.1	0.383
15	1748.0	1.135	182.4	0.456

Cruise: Suncoaster Station: NS03-1 date: 10 Nov 94
lat: 26-19.72 N long: 80-03.03 W depth: 20 m

calc for: 27.6 deg C 36.0 o/oo 20.0 m 400 kHz
ref core: 24.5 deg C 79.91 delta-t 393.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.2	0.998	0.0	0.000
0	1643.2	1.066	186.5	0.466
1	1746.7	1.134	308.9	0.772
2	1739.8	1.129	148.2	0.371
3	1736.3	1.127	143.5	0.359
4	1732.4	1.124	141.9	0.355
5	1735.8	1.127	141.9	0.355
6	1737.3	1.128	140.4	0.351
7	1736.3	1.127	143.5	0.359
8	1743.8	1.132	141.9	0.355
9	1746.2	1.133	145.0	0.363
10	1746.2	1.133	153.1	0.383
11	1740.3	1.129	170.7	0.427
12	1732.9	1.125	184.4	0.461
13	1726.1	1.120	219.3	0.548
14	1717.8	1.115	233.2	0.583

Cruise: Suncoaster Station: NS03-2 date: 10 Nov 94
lat: 26 19.72 N long: 80 03.03 W depth: 20 m

calc for: 27.6 deg C 36.0 o/oo 20.0 m 400 kHz
ref core: 24.5 deg C 79.91 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.0	0.998	2.2	0.006
0	1758.3	1.141	398.4	0.996
1	1723.6	1.119	172.9	0.432
2	1727.0	1.121	184.6	0.462
3	1727.5	1.121	197.4	0.493
4	1716.9	1.114	193.0	0.483
5	1729.5	1.122	199.6	0.499
6	1735.4	1.126	186.7	0.467
7	1737.3	1.128	171.1	0.428
8	1737.8	1.128	163.9	0.410
9	1734.9	1.126	162.1	0.405
10	1726.6	1.121	158.7	0.397
11	1724.6	1.119	171.1	0.428
12	1735.4	1.126	171.1	0.428
13	1743.3	1.131	150.4	0.376
14	1741.3	1.130	162.1	0.405

Cruise: Suncoaster Station: NS03-3 date: 10 Nov 94
lat: 26 19.72 N long: 80 03.03 W depth: 20 m

calc for: 27.6 deg C 36.0 o/oo 20.0 m 400 kHz
ref core: 24.5 deg C 79.93 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1540.7	1.000	0.0	0.000
0	1549.7	1.006	110.3	0.276
1	1720.7	1.117	252.0	0.630
2	1726.1	1.120	162.1	0.405
3	1732.9	1.125	162.1	0.405
4	1733.4	1.125	172.9	0.432
5	1724.1	1.119	178.7	0.447
6	1726.6	1.121	195.2	0.488
7	1730.5	1.123	197.4	0.493
8	1727.0	1.121	195.2	0.488
9	1727.0	1.121	201.9	0.505
10	1727.0	1.121	213.9	0.535
11	1722.7	1.118	241.4	0.603
12	1714.5	1.113	268.6	0.672
13	1704.5	1.106	282.5	0.706
14	1700.7	1.104	253.4	0.633
15	1697.4	1.102	227.0	0.567
16	1698.8	1.103	229.7	0.574
17	1700.7	1.104	257.4	0.643
18	1701.1	1.104	271.6	0.679
19	1704.0	1.106	240.7	0.602
20	1700.2	1.103	273.1	0.683
21	1692.2	1.098	290.8	0.727

Cruise: Suncoaster Station: NS03-4 date: 10 Nov 94
lat: 26 19.72 N long: 80 03.03 W depth: 17 m

calc for: 27.6 deg C 36.0 o/oo 17.0 m 400 kHz
ref core: 24.0 deg C 79.95 delta-t 393.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.5	0.999	0.0	0.000
0	1550.4	1.006	153.1	0.383
1	1550.4	1.006	153.1	0.383
1	1708.5	1.109	214.2	0.535
2	1727.2	1.121	151.4	0.379
3	1726.7	1.121	156.4	0.391
4	1731.1	1.124	178.4	0.446
5	1735.1	1.126	206.7	0.517
6	1724.3	1.119	190.8	0.477
7	1732.6	1.125	182.4	0.456
8	1735.1	1.126	186.5	0.466
9	1737.5	1.128	188.6	0.472
10	1735.1	1.126	197.4	0.493
11	1736.0	1.127	222.0	0.555
12	1740.0	1.129	222.0	0.555
13	1729.7	1.123	216.7	0.542
14	1730.2	1.123	224.7	0.562
15	1733.6	1.125	230.3	0.576
16	1734.1	1.125	227.5	0.569
17	1734.1	1.125	211.7	0.529
18	1733.6	1.125	204.3	0.511
19	1733.6	1.125	239.1	0.598
20	1726.7	1.121	258.6	0.646
21	1727.2	1.121	352.5	0.881

Cruise: Suncoaster Station: NS04-1 date: 10 Nov 94
lat: 26-19.73 N long: 80-03.86 W depth: 17 m

calc for: 27.0 deg C 36.0 o/oo 17.0 m 400 kHz
ref core: 23.5 deg C 79.97 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.5	0.999	2.2	0.006
0	1545.9	1.004	107.9	0.270
1	1703.0	1.106	284.1	0.710
2	1759.2	1.143	113.9	0.285
3	1757.2	1.141	110.3	0.276
4	1757.7	1.142	122.9	0.307
5	1762.7	1.145	135.3	0.338
6	1764.2	1.146	158.7	0.397
7	1760.2	1.143	136.7	0.342
8	1764.2	1.146	148.8	0.372
9	1763.7	1.146	135.3	0.338
10	1760.7	1.144	153.7	0.384
11	1758.7	1.142	163.9	0.410
12	1757.2	1.141	180.6	0.452
13	1763.7	1.146	190.9	0.477
14	1752.1	1.138	232.5	0.581

Cruise: Suncoaster Station: NS04-2 date: 10 Nov 94
lat: 26 19.73 N long: 80 03.86 W depth: 17 m

calc for: 27.0 deg C 36.0 o/oo 17.0 m 400 kHz
ref core: 24.0 deg C 79.96 delta-t 387.5 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.2	0.999	0.0	0.000
0	1542.4	1.002	36.4	0.091
1	1753.4	1.139	127.9	0.320
2	1754.9	1.140	114.5	0.286
3	1755.4	1.140	113.2	0.283
4	1760.0	1.143	135.1	0.338
5	1765.0	1.147	138.1	0.345
6	1763.0	1.145	144.3	0.361
7	1767.1	1.148	161.1	0.403
8	1764.5	1.146	170.3	0.426
9	1760.5	1.144	170.3	0.426
10	1759.0	1.143	168.4	0.421
11	1763.0	1.145	182.2	0.455
12	1757.9	1.142	162.9	0.407
13	1750.9	1.137	164.7	0.412
14	1765.0	1.147	182.2	0.455
15	1764.0	1.146	162.9	0.407
16	1765.0	1.147	159.3	0.398
17	1757.4	1.142	186.3	0.466

Cruise: Suncoaster Station: NS04-3 date: 10 Nov 94
lat: 26 19.73 N long: 80 03.86 W depth: 17 m

calc for: 27.0 deg C 36.0 o/oo 17.0 m 400 kHz
ref core: 24.0 deg C 79.95 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.9	1.000	2.2	0.006
0	1763.5	1.146	201.9	0.505
1	1747.9	1.135	132.4	0.331
2	1752.9	1.139	139.7	0.349
3	1763.5	1.146	145.7	0.364
4	1766.1	1.147	132.4	0.331
5	1763.0	1.145	128.3	0.321
6	1764.0	1.146	135.3	0.338
7	1761.0	1.144	167.4	0.419
8	1774.8	1.153	152.1	0.380
9	1773.7	1.152	145.7	0.364
10	1771.2	1.151	160.4	0.401
11	1751.9	1.138	184.6	0.462
12	1750.4	1.137	229.7	0.574

Cruise: Suncoaster Station: NS04-4 date: 10 Noc 94
lat: 26 19.73 N long: 80 03.86 W depth: 17 m

calc for: 27.0 deg C 36.0 o/oo 17.0 m 400 kHz
ref core: 24.0 deg C 79.95 delta-t 381.2 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.7	1.000	-4.6	-0.011
0	1650.9	1.072	124.2	0.310
1	1752.4	1.138	110.9	0.277
2	1762.5	1.145	110.9	0.277
3	1768.1	1.149	131.4	0.328
4	1769.6	1.150	140.4	0.351
5	1769.1	1.149	135.8	0.340
6	1767.6	1.148	140.4	0.351
7	1762.0	1.145	143.6	0.359
8	1762.0	1.145	162.4	0.406
9	1761.0	1.144	197.4	0.494
10	1747.9	1.135	207.1	0.518
11	1754.4	1.140	202.1	0.505
12	1742.5	1.132	237.6	0.594

Cruise: Suncoaster Station: NS05-1 date: 11 Nov 94
lat: 26 19.5 N long: 80 03.9 W depth: 15 m

calc for: 27.0 deg C 36.0 o/oo 15.0 m 400 kHz
ref core: 23.0 deg C 79.87 delta-t 412.5 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.1	0.998	2.2	0.005
0	1644.6	1.068	173.6	0.434
1	1743.2	1.132	191.1	0.478
2	1752.2	1.138	156.4	0.391
3	1765.3	1.147	131.3	0.328
4	1770.9	1.150	115.9	0.290
5	1772.4	1.151	114.7	0.287
6	1765.8	1.147	158.1	0.395
7	1759.7	1.143	170.0	0.425
8	1754.7	1.140	187.0	0.467
9	1754.2	1.140	195.3	0.488
10	1752.2	1.138	193.1	0.483
11	1744.7	1.133	195.3	0.488
12	1742.2	1.132	215.8	0.539
13	1745.2	1.134	288.5	0.721
14	1754.7	1.140	353.8	0.885
15	1751.2	1.138	256.4	0.641
16	1751.7	1.138	213.4	0.533
17	1744.7	1.133	251.3	0.628
18	1755.7	1.140	226.0	0.565

Cruise: Suncoaster Station: NS05-2 date: 11 Nov 94
lat: 26 19.5 N long: 80 03.91 W depth: 15 m

calc for: 27.0 deg C 36.0 o/oo 15.0 m 400 kHz
ref core: 23.0 deg C 79.87 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.9	0.998	0.0	0.000
0	1763.3	1.145	184.6	0.462
1	1748.2	1.136	128.3	0.321
2	1758.7	1.142	119.3	0.298
3	1765.3	1.147	132.4	0.331
4	1767.3	1.148	132.4	0.331
5	1765.3	1.147	141.2	0.353
6	1764.8	1.146	147.3	0.368
7	1760.2	1.143	145.7	0.364
8	1766.8	1.148	153.7	0.384
9	1764.8	1.146	158.7	0.397
10	1759.7	1.143	169.2	0.423
11	1761.7	1.144	193.0	0.483
12	1767.8	1.148	195.2	0.488
13	1763.8	1.146	197.4	0.493
14	1760.7	1.144	219.0	0.547
15	1749.7	1.137	239.5	0.599
16	1747.2	1.135	309.1	0.773
17	1751.7	1.138	282.5	0.706

Cruise: Suncoaster Station: NS05-3 date: 11 Nov 94
lat: 26 19.5 N long: 80 03.91 W depth: 15 m

calc for: 27.0 deg C 36.0 o/oo 15.0 m 400 kHz
ref core: 23.0 deg C 79.90 delta-t 406.2 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.7	0.998	4.5	0.011
0	1762.8	1.145	216.1	0.540
1	1733.4	1.126	162.6	0.406
2	1750.2	1.137	211.2	0.528
3	1764.3	1.146	180.9	0.452
4	1774.0	1.152	166.1	0.415
5	1766.8	1.148	180.9	0.452
6	1758.7	1.142	253.0	0.632
7	1762.8	1.145	235.9	0.590
8	1761.2	1.144	223.8	0.559
9	1762.8	1.145	211.2	0.528
10	1770.4	1.150	231.9	0.580
11	1778.6	1.155	211.2	0.528
12	1769.9	1.150	213.6	0.534
13	1768.9	1.149	191.0	0.477
14	1767.3	1.148	186.8	0.467
15	1766.8	1.148	193.1	0.483
16	1760.7	1.144	218.6	0.547
17	1751.2	1.138	229.2	0.573
18	1748.7	1.136	213.6	0.534
19	1744.2	1.133	216.1	0.540
20	1733.4	1.126	263.7	0.659

Cruise: Suncoaster   Station: NS05-4   date: 11 Nov 94
lat: 28 19.5 N   long: 80 03.91 W   depth: 15 m

calc for: 27.0 deg C 36.0 o/oo   15.0 m   400 kHz
ref core: 22.8 deg C 79.90 delta-t   406.2 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.9	0.998	0.0	0.000
0	1761.6	1.144	188.9	0.472
1	1745.6	1.134	144.9	0.362
2	1753.1	1.139	136.1	0.340
3	1761.6	1.144	123.8	0.309
4	1767.7	1.148	137.5	0.344
5	1771.8	1.151	149.5	0.374
6	1771.8	1.151	146.4	0.366
7	1774.4	1.153	154.3	0.386
8	1761.6	1.144	237.6	0.594
9	1746.6	1.135	229.2	0.573
10	1738.2	1.129	234.7	0.587
11	1744.6	1.133	221.2	0.553
12	1756.1	1.141	213.6	0.534
13	1759.1	1.143	216.1	0.540
14	1762.1	1.145	213.6	0.534
15	1772.8	1.152	218.6	0.547
16	1759.1	1.143	270.9	0.677
17	1770.3	1.150	208.8	0.522
18	1769.2	1.149	182.8	0.457
19	1776.4	1.154	182.8	0.457
20	1783.6	1.159	195.2	0.488

Cruise: Suncoaster Station: NS06-1 date: 11 Nov 94
lat: 26 19.58 N long: 80 02.99 W depth: 20 m

calc for: 27.0 deg C 36.0 o/oo 20.0 m 400 kHz
ref core: 23.0 deg C 79.94 delta-t 393.8 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.1	1.000	-4.5	-0.011
0	1669.3	1.084	394.3	0.986
1	1710.3	1.111	269.4	0.673
2	1727.6	1.122	428.8	1.072
3	1721.8	1.118	219.3	0.548
4	1709.8	1.111	230.3	0.576
5	1692.3	1.099	242.2	0.605
6	1682.6	1.093	266.4	0.666
7	1679.8	1.091	288.6	0.721
8	1670.2	1.085	319.1	0.798
9	1677.5	1.090	347.2	0.868
10	1668.0	1.083	363.7	0.909
11	1626.8	1.057	583.1	1.458
12	1623.0	1.054	579.6	1.449
13	1641.2	1.066	532.1	1.330
14	1660.3	1.078	440.8	1.102
15	1647.4	1.070	573.2	1.433
16	1662.1	1.080	756.5	1.891
17	1662.5	1.080	739.3	1.848
18	1677.5	1.090	616.4	1.541

Cruise: Suncoaster Station: NS06-2 date: 11 Nov 94
lat: 26 19.57 N long: 80 02.99 W depth: 20 m

calc for: 27.0 deg C 36.0 o/oo 20.0 m 400 kHz
ref core: 22.5 deg C 79.92 delta-t 400.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.1	0.998	-2.2	-0.006
0	1548.8	1.006	162.1	0.405
1	1692.6	1.099	213.9	0.535
2	1704.3	1.107	224.3	0.561
3	1690.3	1.098	296.1	0.740
4	1689.8	1.098	305.3	0.763
5	1704.3	1.107	268.6	0.672
6	1713.4	1.113	262.9	0.657
7	1723.0	1.119	268.6	0.672
8	1723.5	1.120	221.6	0.554
9	1721.1	1.118	219.0	0.547
10	1715.8	1.114	199.6	0.499
11	1712.9	1.113	201.9	0.505
12	1715.8	1.114	227.0	0.567
13	1720.1	1.117	227.0	0.567
14	1715.3	1.114	247.6	0.619
15	1694.9	1.101	371.8	0.930
16	1691.7	1.099	448.1	1.120
17	1670.1	1.085	504.6	1.262
18	1663.3	1.080	557.6	1.394
19	1669.6	1.085	557.6	1.394

Cruise: Suncoaster   Station: NS06-3   date: 11 Nov 94
lat: 26 19.57 N   long: 80 02.99 W   depth: 20 m

calc for: 27.0 deg C   36.0 o/oo   20.0 m   400 kHz
ref core: 22.5 deg C   79.95 delta-t   406.2 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.5	0.999	0.0	0.000
0	1657.9	1.077	243.0	0.607
1	1708.1	1.110	234.7	0.587
2	1714.8	1.114	208.8	0.522
3	1716.7	1.115	201.8	0.505
4	1717.7	1.116	234.7	0.587
5	1716.3	1.115	246.6	0.617
6	1714.3	1.114	234.7	0.587
7	1713.9	1.113	259.6	0.649
8	1717.7	1.116	259.6	0.649
9	1715.3	1.114	243.6	0.609
10	1715.3	1.114	572.3	1.431
11	1721.1	1.118	243.6	0.609
12	1719.6	1.117	243.6	0.609
13	1720.1	1.117	266.5	0.666
14	1716.7	1.115	273.8	0.685
15	1713.4	1.113	273.8	0.685
16	1715.8	1.114	293.0	0.733
17	1715.3	1.114	293.0	0.733
18	1710.5	1.111	309.4	0.774

Cruise: Suncoaster   Station: NS06-4   date: 11 Nov 94
lat: 26 19.57 N   long: 80 03.80 W   depth: 19 m

calc for: 27.0 deg C   36.0 o/oo   19.0 m   400 kHz
ref core: 22.5 deg C   79.97 delta-t   412.5 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.7	0.998	0.0	0.000
0	1756.5	1.141	509.0	1.273
1	1713.4	1.113	185.0	0.463
2	1706.2	1.108	199.6	0.499
3	1703.4	1.106	213.4	0.533
4	1694.9	1.101	231.3	0.578
5	1686.5	1.096	228.6	0.572
6	1682.8	1.093	242.7	0.607
7	1659.7	1.078	315.5	0.789
8	1648.5	1.071	343.8	0.860
9	1666.4	1.082	370.3	0.926
10	1681.9	1.093	319.5	0.799

Cruise: Suncoaster   Station: NS07-1   date: 11 Nov 94
lat: 26 19.48 N   long: 80 03.80 W   depth: 19 m

calc for: 27.0 deg C   36.0 o/oo   19.0 m   400 kHz
ref core: 22.5 deg C   79.94 delta-t   412.5 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.5	0.999	2.2	0.005
0	1755.0	1.140	247.6	0.619
1	1740.1	1.130	119.5	0.299
2	1745.5	1.134	141.1	0.353
3	1755.0	1.140	147.0	0.368
4	1755.5	1.140	158.1	0.395
5	1754.0	1.139	193.2	0.483
6	1749.0	1.136	234.1	0.585
7	1748.5	1.136	231.4	0.579
8	1757.0	1.141	218.2	0.546
9	1757.5	1.142	193.2	0.483
10	1759.5	1.143	193.2	0.483
11	1759.0	1.143	210.9	0.527
12	1755.5	1.140	206.3	0.516
13	1754.5	1.140	201.8	0.504
14	1756.0	1.141	195.2	0.488
15	1757.5	1.142	195.2	0.488
16	1760.5	1.144	187.0	0.468
17	1762.5	1.145	189.0	0.472
18	1761.0	1.144	187.0	0.468
19	1759.5	1.143	191.1	0.478
20	1766.6	1.148	195.2	0.488
21	1759.5	1.143	225.9	0.565
22	1759.5	1.143	239.7	0.599
23	1762.5	1.145	231.4	0.579
24	1762.5	1.145	231.4	0.579

Cruise: Suncoaster Station: NS07-2 date: 11 Nov 94
lat: 26 19.48 N long: 80 03.80 W depth: 19 m

calc for: 27.0 deg C 36.0 o/oo 19.0 m 400 kHz
ref core: 22.5 deg C 79.95 delta-t 412.5 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.7	0.999	2.2	0.005
0	1759.0	1.143	147.0	0.368
1	1757.0	1.141	122.1	0.305
2	1762.5	1.145	141.1	0.353
3	1759.0	1.143	131.3	0.328
4	1759.0	1.143	153.2	0.383
5	1759.0	1.143	153.2	0.383
6	1758.5	1.142	154.8	0.387
7	1757.5	1.142	158.1	0.395
8	1755.5	1.140	163.1	0.408
9	1756.0	1.141	179.2	0.448
10	1759.0	1.143	177.3	0.443
11	1757.5	1.142	183.0	0.458
12	1760.5	1.144	215.8	0.539
14	1750.5	1.137	189.0	0.473
15	1744.0	1.133	177.3	0.443
16	1746.0	1.134	177.3	0.443
17	1745.5	1.134	187.0	0.467
18	1748.0	1.135	191.1	0.478
19	1754.5	1.140	189.0	0.473
20	1750.5	1.137	191.1	0.478
21	1740.6	1.131	183.0	0.458
22	1740.1	1.130	185.0	0.463
23	1738.6	1.129	263.1	0.658

Cruise: Suncoaster   Station: NS07-3   date: 11 Nov 94
lat: 26 19.48 N   long: 80 03.80 W   depth: 19 m

calc for: 27.0 deg C 36.0 o/oo   19.0 m   400 kHz
ref core: 22.5 deg C 79.95 delta-t   406.2 H   0.001 V/D
smp core: 36.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.999	4.5	0.011
0	1541.8	1.001	90.2	0.225
1	1745.0	1.133	169.6	0.424
2	1749.0	1.136	140.4	0.351
3	1749.0	1.136	140.4	0.351
4	1753.0	1.139	171.4	0.429
5	1750.0	1.137	180.9	0.452
6	1750.0	1.137	167.8	0.420
7	1750.5	1.137	147.9	0.370
8	1753.5	1.139	167.8	0.420
9	1755.5	1.140	173.3	0.433
10	1749.5	1.136	173.3	0.433
11	1752.5	1.138	178.9	0.447
12	1751.5	1.138	173.3	0.433
13	1755.5	1.140	173.3	0.433
14	1750.5	1.137	166.1	0.415
15	1751.0	1.137	193.1	0.483
16	1757.0	1.141	226.5	0.566
17	1760.5	1.144	186.8	0.467
18	1761.5	1.144	226.5	0.566
19	1759.5	1.143	259.6	0.649

Cruise: Suncoaster Station: NS07-4 date: 11 Nov 94
lat: 26 19.48 N long: 80 03.80 W depth: 19 m

calc for: 27.0 deg C 36.0 o/oo 19.0 m 400 kHz
ref core: 22.5 deg C 79.95 delta-t 406.2 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.999	0.0	0.000
0	1648.5	1.071	151.1	3.776
1	1748.0	1.135	118.7	2.966
2	1754.0	1.139	129.1	3.228
3	1758.0	1.142	141.9	3.547
4	1752.5	1.138	146.4	3.660
5	1742.0	1.132	171.4	4.286
6	1740.1	1.130	216.1	5.403
7	1736.6	1.128	240.6	6.014
8	1747.0	1.135	151.1	3.776
9	1747.0	1.135	146.4	3.660
10	1752.5	1.138	160.9	4.022
11	1767.1	1.148	169.6	4.240
12	1765.6	1.147	155.9	3.897
13	1766.6	1.148	160.9	4.022
14	1769.6	1.150	159.2	3.980
15	1774.2	1.152	164.3	4.108
16	1777.8	1.155	175.1	4.378
17	1772.2	1.151	186.8	4.671
18	1765.1	1.147	180.9	4.522
19	1764.1	1.146	182.8	4.571
20	1761.5	1.144	191.0	4.774
21	1769.1	1.149	191.0	4.774

3.1.1.2 Indian Rocks Beach and Lower Tampa Bay Diver Cores:

EK1-1
EK1-2
EK1-3
EK1-4
EK2-1
EK2-2
EK2-3
EK2-4
IRB5-1
IRB5-2
IRB5-3
IRB5-4
IRB6-1
IRB6-2
IRB6-3
IRB6-4
LTB1-1
LTB1-2
LTB1-3
LTB1-4
LTB2-1
LTB2-2
LTB2-3
LTB2-4
LTB3-1
LTB3-2
LTB3-3
LTB3-4
LTB4-1
LTB4-2
LTB4-3
LTB4-4
LTB5-1
LTB5-2

Cruise: TBAC Station: EK1-1 date: 6 JUN 95
lat: 27-37.49 N long: 82-51.00 W depth: 8 m

calc for: 27.9 deg C 35.0 o/oo 8.0 m 400 kHz
ref core: 26.5 deg C 82.56 delta-t 306.2 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.7	0.999	4.4	0.011
0	1651.9	1.072	95.8	0.240
1	1771.6	1.150	146.6	0.367
2	1771.1	1.150	178.4	0.446
3	1733.4	1.125	360.3	0.901
4	1670.8	1.085	299.0	0.748
5	1653.7	1.074	271.1	0.678
6	1669.9	1.084	299.0	0.748
7	1667.7	1.083	308.9	0.772
8	1666.7	1.082	367.8	0.920
9	1658.6	1.077	501.3	1.253
10	1660.4	1.078	557.9	1.395
11	1659.0	1.077	327.8	0.820
12	1661.3	1.079	281.2	0.703
13	1654.6	1.074	292.1	0.730
14	1653.2	1.073	267.2	0.668

Cruise: TBAC Station: EK1-2 date: 6 JUN 95
lat: 27-37.49 N long: 82-51.00 W depth: 8 m

calc for: 27.9 deg C 35.0 o/oo 8.0 m 400 kHz
ref core: 26.1 deg C 82.55 delta-t 306.2 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.999	0.0	0.000
0	1546.9	1.004	155.0	0.387
1	1613.0	1.047	448.5	1.121
2	1692.5	1.099	292.1	0.730
3	1701.9	1.105	271.1	0.678
4	1694.3	1.100	423.6	1.059
5	1672.1	1.086	480.7	1.202
6	1650.4	1.072	437.1	1.093
7	1640.7	1.065	415.4	1.039
8	1631.9	1.060	340.0	0.850
9	1632.8	1.060	267.2	0.668
10	1647.8	1.070	294.4	0.736
11	1659.4	1.077	299.0	0.748
12	1668.4	1.083	346.5	0.866
13	1654.9	1.074	310.1	0.775
14	1669.3	1.084	319.4	0.799

Cruise: TBAC **Station: EK1-3** **date: 6 JUN 95**
lat: 27-37.49 N **long: 82-51.00 W** **depth: 8 m**

calc for: 27.9 deg C 35.0 o/oo 8.0 m 400 kHz
ref core: 26.0 deg C 82.56 delta-t 306.2 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.100	0.998	0.0	0.000
0	1651.700	1.072	170.9	0.427
1	1761.100	1.143	166.2	0.416
2	1755.100	1.139	232.1	0.580
3	1673.400	1.086	316.7	0.792
4	1658.900	1.077	258.1	0.645
5	1650.800	1.072	275.0	0.688
6	1638.500	1.064	254.6	0.636
7	1658.900	1.077	400.1	1.000
8	1621.100	1.053	426.6	1.066
9	1633.200	1.060	351.5	0.879
10	1660.700	1.078	390.8	0.977

Cruise: TBAC **Station: EK1-4** **date: 6 JUN 95**
lat: 27-37.49 N **long: 82-51.00 W** **depth: 8 m**

calc for: 27.9 deg C 35.0 o/oo 8.0 m 400 kHz
ref core: 26.0 deg C 82.57 delta-t 306.2 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.100	0.998	-1.4	-0.004
0	1544.100	1.003	56.3	0.141
1	1763.600	1.145	183.6	0.459
2	1752.500	1.138	277.1	0.693
3	1726.700	1.121	219.3	0.548
4	1734.100	1.126	173.4	0.433
5	1732.600	1.125	448.5	1.121
6	1649.400	1.071	319.4	0.799
7	1647.700	1.070	333.8	0.834
8	1648.500	1.070	325.0	0.812
9	1650.300	1.071	379.9	0.950
10	1658.400	1.077	462.7	1.157
11	1669.200	1.084	534.2	1.336
12	1651.200	1.072	320.8	0.802
13	1654.800	1.074	329.3	0.823
14	1662.000	1.079	325.0	0.812

Cruise: TBAC **Station: EK2-1** **date: 7 JUN 95**
lat: 27-37.48 N **long: 82-50.50 W** **depth: 7 m**

calc for: 28.1 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 28.0 deg C 82.66 delta-t 293.8 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.2	0.999	-3.0	-0.007
0	1654.4	1.074	97.2	0.243
1	1760.0	1.142	191.5	0.479
2	1753.4	1.138	183.0	0.458
3	1763.6	1.145	180.3	0.451
4	1775.9	1.153	230.7	0.577
5	1758.0	1.141	279.5	0.699
6	1665.3	1.081	267.1	0.668
7	1796.8	1.166	226.2	0.565
8	1802.1	1.170	269.1	0.673
9	1674.4	1.087	394.2	0.985

Cruise: TBAC **Station: EK2-2** **date: 7 JUN 95**
lat: 27-37.48 N **long: 82-50.50 W** **depth: 7 m**

calc for: 28.1 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 26.8 deg C 82.59 delta-t 300.0 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.998	1.5	0.004
0	1775.8	1.153	200.4	0.501
1	1761.9	1.144	152.0	0.380
2	1772.7	1.151	168.0	0.420
3	1781.0	1.156	158.7	0.397
4	1782.5	1.157	154.2	0.386
5	1778.9	1.155	163.3	0.408
6	1765.5	1.146	243.2	0.608
7	1747.3	1.134	233.7	0.584
8	1747.3	1.134	243.2	0.608
9	1719.8	1.116	236.8	0.592
10	1744.8	1.133	293.7	0.734
11	1731.5	1.124	341.9	0.855
12	1706.3	1.108	335.5	0.839
13	1710.1	1.110	293.7	0.734
14	1704.4	1.106	452.5	1.131
15	1711.1	1.111	484.3	1.211

Cruise: TBAC **Station: EK2-3** **date: 7 JUN 95**
lat: 27-37.48 N **long: 82-50.50 W** **depth: 7 m**

calc for: 28.1 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 26.8 deg C 82.60 delta-t 287.5 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.5	0.998	-3.1	-0.008
0	1773.2	1.151	188.4	0.471
1	1758.4	1.141	143.8	0.360
2	1747.8	1.134	143.8	0.360
3	1748.8	1.135	159.6	0.399
4	1758.4	1.141	169.4	0.423
5	1766.0	1.146	139.7	0.349
6	1763.5	1.145	157.2	0.393
7	1751.8	1.137	162.0	0.405
8	1753.3	1.138	171.9	0.430
9	1734.9	1.126	254.5	0.636
10	1726.1	1.120	274.3	0.686
11	1702.0	1.105	305.0	0.763
12	1702.0	1.105	270.1	0.675

Cruise: TBAC **Station: EK2-4** **date: 7 JUN 95**
lat: 27-37.48 N **long: 82-50.50 W** **depth: 7 m**

calc for: 28.1 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 26.7 deg C 82.59 delta-t 303.1 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.8	0.999	3.0	0.007
0	1777.9	1.154	176.9	0.442
1	1764.5	1.145	145.1	0.363
2	1762.0	1.144	151.4	0.378
3	1775.3	1.152	167.1	0.418
4	1787.2	1.160	147.2	0.368
5	1788.8	1.161	153.5	0.384
6	1780.5	1.156	167.1	0.418
7	1761.5	1.143	219.3	0.548
8	1754.4	1.139	201.3	0.503
9	1738.4	1.128	254.8	0.637
10	1750.9	1.136	275.6	0.689
11	1726.6	1.121	317.9	0.795
12	1714.5	1.113	490.3	1.226
13	1733.0	1.125	408.6	1.022
14	1729.1	1.122	271.6	0.679
15	1744.4	1.132	279.8	0.699
16	1740.9	1.130	317.9	0.795
17	1711.1	1.111	414.0	1.035

Cruise: TBAC　　Station: IRB5-1　　date: 3 JUN 95
lat: 27 55.96 N　　long: 82-52.65 W　　depth: 4 m

calc for: 28.6 deg C　35.0 o/oo　　4.0 m　　400 kHz
ref core: 24.5 deg C　82.60 delta-t　　290.6 H　0.001 V/D
smp core: 35.0 o/oo　6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1540.3	0.999	0.0	0.000
0	1651.9	1.072	170.9	0.427
1	1767.1	1.146	149.7	0.374
2	1782.5	1.156	131.2	0.328
3	1784.6	1.158	125.6	0.314
4	1785.1	1.158	125.6	0.314
5	1787.2	1.159	135.1	0.338
6	1791.3	1.162	123.7	0.309

Cruise: TBAC　　Station: IRB5-2　　date: 3 JUN 95
lat: 27-55.96 N　　long: 82-52.65 W　　depth: 4 m

calc for: 28.6 deg C　35.0 o/oo　　4.0 m　　400 kHz
ref core: 24.5 deg C　82.56 delta-t　　290.6 H　0.001 V/D
smp core: 35.0 o/oo　6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1540.3	0.999	0.0	0.000
0	1652.8	1.072	165.9	0.415
1	1772.7	1.150	116.6	0.292
2	1780.4	1.155	131.2	0.328
3	1776.8	1.153	120.1	0.300
4	1775.8	1.152	120.1	0.300
5	1774.2	1.151	139.1	0.348
6	1763.5	1.144	133.2	0.333
7	1767.6	1.147	135.1	0.338
8	1775.3	1.152	131.2	0.328
9	1781.5	1.156	143.3	0.358
10	1766.1	1.146	158.8	0.397
11	1767.1	1.146	173.5	0.434
12	1765.6	1.145	220.3	0.551
13	1761.0	1.142	267.6	0.669
14	1744.0	1.131	314.7	0.787

Cruise: TBAC **Station: IRB5-3** **date: 3 JUN 95**
lat: 27-55.96 N **long: 82-52.65 W** **depth: 4 m**

calc for: 28.6 deg C 35.0 o/oo 4.0 m 400 kHz
ref core: 24.5 deg C 82.54 delta-t 290.6 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.6	0.999	0.0	0.000
0	1647.5	1.069	207.9	0.520
1	1771.7	1.149	143.3	0.358
2	1778.9	1.154	123.7	0.309
3	1775.8	1.152	127.4	0.319
4	1766.6	1.146	137.1	0.343
5	1761.5	1.143	137.1	0.343
6	1767.6	1.147	133.2	0.333
7	1771.2	1.149	123.7	0.309
8	1771.2	1.149	141.2	0.353
9	1772.7	1.150	137.1	0.343
10	1775.3	1.152	129.3	0.323
11	1781.5	1.156	131.2	0.328
12	1774.8	1.151	151.9	0.380
13	1765.1	1.145	151.9	0.380
14	1759.5	1.141	181.5	0.454

Cruise: TBAC **Station: IRB5-4** **date: 3 JUN 95**
lat: 27-55.96 N **long: 82-52.65 W** **depth: 4 m**

calc for: 28.6 deg C 35.0 o/oo 4.0 m 400 kHz
ref core: 24.5 deg C 82.55 delta-t 290.6 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.6	0.999	0.0	0.000
0	1651.9	1.072	168.4	0.421
1	1774.2	1.151	137.1	0.343
2	1780.9	1.155	133.2	0.333
3	1780.4	1.155	137.1	0.343
4	1777.8	1.153	139.1	0.348
5	1787.7	1.160	135.1	0.338
6	1786.6	1.159	131.2	0.328
7	1784.6	1.158	149.7	0.374
8	1782.0	1.156	153.5	0.384
9	1769.6	1.148	156.4	0.391
10	1768.6	1.147	280.2	0.700
11	1773.7	1.151	273.8	0.684
12	1767.6	1.147	178.8	0.447
13	1766.1	1.146	214.6	0.537
14	1742.5	1.130	211.9	0.530
15	1734.6	1.125	226.1	0.565
16	1719.5	1.115	303.9	0.760

Cruise: TBAC **Station: IRB6-1** **date: 3 JUN 95**
lat: 27-56.34 N **long: 82-54.47 W** **depth: 7 m**

calc for: 28.5 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 24.2 deg C 82.56 delta-t 290.6 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.0	0.998	0.0	0.000
0	1455.4	0.944	205.3	0.513
1	1725.5	1.119	196.5	0.491
2	1740.7	1.129	197.7	0.494
3	1757.1	1.140	161.1	0.403
4	1760.1	1.142	143.3	0.358
5	1761.2	1.143	163.5	0.409
6	1755.1	1.139	158.8	0.397
7	1762.2	1.143	187.1	0.468
8	1759.1	1.141	205.3	0.513
9	1746.1	1.133	358.5	0.896
10	1709.6	1.109	405.2	1.013
11	1702.5	1.104	619.4	1.549
12	1694.5	1.099	317.5	0.794
13	1695.9	1.100	280.2	0.700

Cruise: TBAC **Station: IRB6-2** **date: 3 JUN 95**
lat: 27-56.34 N **long: 82-54.47 W** **depth: 7 m**

calc for: 28.5 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 27.2 deg C 82.58 delta-t 290.6 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1541.0	1.000	-1.5	-0.004
0	1542.2	1.000	60.0	0.150
1	1773.8	1.151	370.4	0.926
2	1725.2	1.119	420.5	1.051
3	1710.7	1.110	439.4	1.098
4	1726.1	1.120	453.5	1.134
5	1746.9	1.133	543.1	1.358
6	1699.7	1.103	873.4	2.184
7	1681.5	1.091	1005.0	2.513
8	1686.1	1.094	1098.2	2.745
13	1659.5	1.077	1068.6	2.671
14	1692.6	1.098	744.3	1.861
15	1721.3	1.117	484.3	1.211
16	1691.2	1.097	569.9	1.425
17	1681.5	1.091	795.4	1.988
18	1676.8	1.088	1208.3	3.021

Cruise: TBAC Station: IRB6-3 date: 3 JUN 95
lat: 27-56.34 N long: 82-54.47 W depth: 7 m

calc for: 28.5 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 24.8 deg C 82.58 delta-t 284.4 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	0.998	1.6	0.004
0	1543.3	1.001	178.4	0.446
1	1709.9	1.109	247.5	0.619
2	1730.2	1.122	219.3	0.548
3	1721.9	1.117	321.7	0.804
4	1739.5	1.128	321.7	0.804
5	1739.5	1.128	256.7	0.642
6	1746.9	1.133	195.8	0.490
7	1745.4	1.132	181.1	0.453
8	1734.6	1.125	223.0	0.558
9	1724.3	1.119	234.8	0.587
10	1714.2	1.112	252.0	0.630

Cruise: TBAC Station: IRB6-4 date: 3 JUN 95
lat: 27-56.34 N long: 82-54.47 W depth: 7 m

calc for: 28.5 deg C 35.0 o/oo 7.0 m 400 kHz
ref core: 25.0 deg C 82.59 delta-t 284.4 H 0.001 V/D
smp core: 35.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.9	0.998	1788.2	4.470
0	1549.6	1.005	184.0	0.460
1	1701.0	1.103	261.5	0.654
2	1721.0	1.116	314.4	0.786
3	1710.5	1.110	468.0	1.170
4	1699.1	1.102	529.9	1.325
5	1719.1	1.115	397.0	0.993
6	1713.3	1.111	342.7	0.857
7	1673.1	1.085	543.6	1.359
8	1685.1	1.093	431.3	1.078
9	1701.9	1.104	335.9	0.840
10	1702.9	1.105	295.8	0.739
11	1697.7	1.101	335.9	0.840

Cruise: TBAC   Station: LTB1-1   date: 4 JUN 95
lat: 27-33.50 N   long: 82-41.20 W   depth: 5 m

calc for: 27.7 deg C   33.0 o/oo   5.0 m   400 kHz
ref core: 25.5 deg C   82.56 delta-t   300.0 H   0.001 V/D
smp core: 33.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.2	0.998	0.0	0.000
0	1539.1	1.001	268.2	0.670
1	1685.4	1.096	359.3	0.898
2	1691.9	1.100	397.2	0.993
3	1692.4	1.101	584.7	1.462
4	1685.4	1.096	821.0	2.052
5	1655.8	1.077	1048.6	2.622
6	1620.7	1.054	681.7	1.704
7	1697.1	1.104	630.2	1.575
8	1695.7	1.103	394.8	0.987
9	1696.2	1.103	387.8	0.970
10	1708.5	1.111	332.4	0.831
11	1696.2	1.103	407.2	1.018
12	1695.7	1.103	352.1	0.880
13	1699.5	1.105	381.2	0.953

Cruise: TBAC   Station: LTB1-2   date: 4 JUN 95
lat: 27-33.50 N   long: 82-41.20 W   depth: 5 m

calc for: 27.7 deg C   33.0 o/oo   5.0 m   400 kHz
ref core: 25.5 deg C   82.56 delta-t   300.0 H   0.001 V/D
smp core: 33.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.9	1.001	-1.5	-0.004
0	1540.3	1.002	66.9	0.167
1	1669.3	1.086	280.4	0.701
2	1686.8	1.097	316.5	0.791
3	1721.5	1.120	357.4	0.894
4	1729.2	1.125	280.4	0.701
5	1740.1	1.132	260.6	0.651
6	1747.0	1.136	223.4	0.558
7	1764.2	1.147	229.2	0.573
8	1756.1	1.142	434.2	1.085
9	1702.8	1.107	821.0	2.052
10	1702.8	1.107	584.7	1.462
11	1714.7	1.115	348.6	0.871
12	1727.3	1.123	333.9	0.835
13	1733.7	1.127	276.2	0.690
14	1742.1	1.133	319.2	0.798
15	1729.7	1.125	498.4	1.246
16	1754.0	1.141	440.6	1.102
17	1752.5	1.140	488.8	1.222
18	1721.0	1.119	469.6	1.174

Cruise: TBAC **Station: LTB1-3** **date: 4 JUN 95**
lat: 27-33.50 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.7 deg C 33.0 o/oo 5.0 m 400 kHz
ref core: 25.5 deg C 82.56 delta-t 303.1 H 0.001 V/D
smp core: 33.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.2	1.000	1.5	0.004
0	1538.7	1.001	295.2	0.738
1	1637.1	1.065	497.3	1.243
2	1678.9	1.092	539.0	1.348
3	1679.9	1.093	457.6	1.144
4	1709.9	1.112	323.5	0.809
5	1708.5	1.111	275.6	0.689
6	1712.8	1.114	286.2	0.715
7	1722.9	1.121	304.9	0.762
8	1726.3	1.123	288.4	0.721
9	1729.7	1.125	297.6	0.744
10	1717.6	1.117	309.9	0.775
11	1705.6	1.109	277.7	0.694
12	1706.1	1.110	275.6	0.689
13	1704.2	1.108	262.0	0.655
14	1705.1	1.109	258.4	0.646
15	1715.2	1.115	262.0	0.655
16	1702.3	1.107	256.6	0.642
17	1714.2	1.115	307.4	0.768
18	1722.9	1.121	323.5	0.809
19	1739.1	1.131	461.2	1.153
20	1726.8	1.123	575.9	1.440
21	1710.4	1.112	723.8	1.809
22	1698.5	1.105	623.2	1.558
23	1705.1	1.109	632.8	1.582

Cruise: TBAC **Station: LTB1-4** **date: 4 JUN 95**
lat: 27-33.50 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.7 deg C 33.0 o/oo 5.0 m 400 kHz
ref core: 25.5 deg C 82.58 delta-t 303.1 H 0.001 V/D
smp core: 33.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	1.000	1.5	0.004
0	1548.1	1.007	149.3	0.373
1	1660.7	1.080	323.5	0.809
2	1683.6	1.095	351.8	0.879
3	1685.9	1.096	443.7	1.109
4	1674.3	1.089	921.2	2.303
5	1457.7	0.948	692.6	1.731
6	1681.7	1.094	651.2	1.628
7	1684.5	1.096	438.8	1.097
8	1706.1	1.110	382.7	0.957
9	1709.0	1.111	322.1	0.805
10	1708.5	1.111	288.4	0.721
11	1717.6	1.117	295.2	0.738
12	1728.3	1.124	286.2	0.715
13	1727.3	1.123	297.6	0.744
14	1716.1	1.116	267.7	0.669
15	1711.8	1.113	269.6	0.674
16	1706.1	1.110	256.6	0.642
17	1686.3	1.097	295.2	0.738

Cruise: TBAC **Station: LTB2-1** **date: 4 JUN 95**
lat: 27-32.99 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.8 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 25.5 deg C 82.60 delta-t 296.9 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.1	1.000	-1.5	-0.004
0	1662.4	1.080	266.7	0.667
1	1682.1	1.093	169.0	0.422
2	1703.6	1.107	214.9	0.537
3	1718.5	1.117	184.5	0.461
4	1727.7	1.123	198.9	0.497
5	1725.3	1.121	219.0	0.548
6	1729.2	1.124	203.2	0.508
7	1732.6	1.126	205.7	0.514
8	1739.0	1.130	214.9	0.537
9	1737.0	1.129	208.3	0.521
10	1743.5	1.133	219.0	0.548
11	1743.9	1.133	217.6	0.544
12	1744.9	1.134	235.3	0.588

Cruise: TBAC **Station: LTB2-2** **date: 4 JUN 95**
lat: 27-32.99 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.8 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 25.6 deg C 82.58 delta-t 303.1 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.8	1.001	1.5	0.004
0	1658.9	1.078	191.9	0.480
1	1715.6	1.115	174.4	0.436
2	1733.6	1.127	190.2	0.476
3	1740.0	1.131	204.9	0.512
4	1736.6	1.128	201.9	0.505
5	1732.6	1.126	190.2	0.476
6	1720.0	1.118	224.8	0.562
7	1725.3	1.121	238.3	0.596
8	1736.6	1.128	229.2	0.573
9	1740.0	1.131	212.6	0.531
10	1742.0	1.132	219.3	0.548
11	1719.0	1.117	313.9	0.785
12	1693.3	1.100	301.2	0.753
13	1676.1	1.089	284.0	0.710
14	1673.4	1.087	295.2	0.738
15	1672.9	1.087	265.8	0.664
16	1671.6	1.086	271.6	0.679
17	1679.4	1.091	355.3	0.888
18	1689.1	1.098	281.8	0.705
19	1690.0	1.098	295.2	0.738
20	1700.8	1.105	414.0	1.035

Cruise: TBAC **Station: LTB2-3** **date: 4 JUN 95**
lat: 27-32.99 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.8 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 25.6 deg C 82.59 delta-t 300.0 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.9	0.999	1.5	0.004
0	1655.3	1.076	139.7	0.349
1	1679.4	1.091	229.2	0.573
2	1709.9	1.111	239.9	0.600
3	1729.2	1.124	180.6	0.452
4	1737.6	1.129	183.3	0.458
5	1743.0	1.133	183.3	0.458
6	1743.0	1.133	180.6	0.452
7	1733.6	1.127	197.4	0.493
8	1732.6	1.126	183.3	0.458
9	1735.1	1.127	180.6	0.452
10	1738.1	1.129	183.3	0.458
11	1739.0	1.130	213.1	0.533
12	1734.1	1.127	216.4	0.541

Cruise: TBAC **Station: LTB2-4** **date: 4 JUN 95**
lat: 27-32.99 N **long: 82-41.20 W** **depth: 5 m**

calc for: 27.8 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 25.5 deg C 82.56 delta-t 303.1 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.5	0.999	1.5	0.004
0	1647.7	1.071	267.7	0.669
1	1697.5	1.103	212.6	0.531
2	1715.1	1.115	195.3	0.488
3	1723.3	1.120	174.4	0.436
4	1729.2	1.124	201.9	0.505
5	1725.3	1.121	208.1	0.520
6	1719.9	1.118	211.3	0.528
7	1715.6	1.115	198.9	0.497
8	1730.1	1.124	217.9	0.545
9	1728.2	1.123	211.3	0.528
10	1735.5	1.128	208.1	0.520
11	1743.9	1.133	233.6	0.584
12	1732.6	1.126	230.6	0.577
13	1727.2	1.122	269.6	0.674

Cruise: TBAC   Station: LTB3-1   date: 4 JUN 95
lat: 27-33.00 N   long: 82-40.50 W   depth: 5 m

calc for: 27.7 deg C 34.0 o/oo   5.0 m   400 kHz
ref core: 25.5 deg C 82.59 delta-t   303.1 H   0.001 V/D
smp core: 34.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1539.2	1.000	0.0	0.000
0	1664.5	1.082	233.6	0.584
1	1697.3	1.103	190.2	0.476
2	1702.0	1.106	198.9	0.497
3	1715.8	1.115	208.1	0.520
4	1729.4	1.124	239.8	0.600
5	1748.7	1.136	230.6	0.577
6	1756.7	1.142	226.3	0.566
7	1751.2	1.138	241.4	0.604
8	1757.2	1.142	236.7	0.592
9	1762.8	1.146	215.2	0.538
10	1745.2	1.134	208.7	0.522
11	1739.2	1.130	230.6	0.577
12	1737.8	1.129	246.3	0.616
13	1724.0	1.120	307.4	0.768

Cruise: TBAC   Station: LTB3-2   date: 4 JUN 95
lat: 27-33.00 N   long: 82-40.50 W   depth: 5 m

calc for: 27.7 deg C 34.0 o/oo   5.0 m   400 kHz
ref core: 26.8 deg C 82.63 delta-t   287.5 H   0.001 V/D
smp core: 34.0 o/oo   6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1536.0	0.998	0.0	0.000
0	1658.3	1.078	166.9	0.417
1	1676.5	1.090	272.2	0.681
2	1677.9	1.090	230.7	0.577
3	1732.6	1.126	315.9	0.790
4	1763.2	1.146	182.3	0.456
5	1775.0	1.154	171.9	0.430
6	1778.6	1.156	177.2	0.443
7	1782.7	1.159	185.5	0.464
8	1782.2	1.158	182.7	0.457

Cruise: TBAC **Station: LTB3-3** **date: 4 JUN 95**
lat: 27-33.00 N **long: 82-40.50 W** **depth: 5 m**

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.8 deg C 82.62 delta-t 287.5 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.2	0.999	0.0	0.000
0	1659.2	1.078	148.2	0.370
1	1695.6	1.102	364.7	0.912
2	1712.2	1.113	226.1	0.565
3	1729.7	1.124	169.4	0.423
4	1740.0	1.131	171.9	0.430
5	1764.2	1.147	166.9	0.417
6	1771.9	1.152	182.7	0.457
7	1781.2	1.158	429.7	1.074
9	1704.6	1.108	482.7	1.207
10	1728.2	1.123	274.3	0.686
11	1737.1	1.129	247.3	0.618
12	1742.5	1.132	249.1	0.623
13	1740.0	1.131	213.1	0.533
14	1745.0	1.134	233.9	0.585
15	1727.7	1.123	283.1	0.708
16	1718.5	1.117	280.8	0.702
17	1716.6	1.116	360.8	0.902
18	1709.8	1.111	327.9	0.820
19	1712.7	1.113	280.8	0.702
20	1721.4	1.119	256.4	0.641
21	1728.7	1.124	272.2	0.681
22	1717.0	1.116	254.5	0.636
23	1707.4	1.110	256.4	0.641
24	1705.5	1.108	313.2	0.783
25	1720.4	1.118	287.7	0.719
26	1741.0	1.132	292.4	0.731
27	1738.1	1.130	297.3	0.743
28	1742.5	1.132	280.8	0.702
29	1761.1	1.145	252.7	0.632
30	1756.6	1.142	262.1	0.655
31	1753.5	1.140	316.0	0.790

Cruise: TBAC **Station: LTB3-4** **date: 4 JUN 95**
lat: 27-33.00 N **long: 82-40.50 W** **depth: 5 m**

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.8 deg C 82.61 delta-t 290.6 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.6	0.999	0.0	0.000
0	1767.8	1.149	263.6	0.659
1	1723.3	1.120	178.8	0.447
2	1727.7	1.123	200.2	0.500
3	1742.0	1.132	188.2	0.471
4	1758.6	1.143	165.9	0.415
5	1767.8	1.149	165.9	0.415
6	1767.8	1.149	184.2	0.461
7	1764.7	1.147	189.9	0.475
8	1756.6	1.142	202.1	0.505
9	1757.1	1.142	202.1	0.505
10	1756.1	1.141	187.1	0.468
11	1755.1	1.141	215.3	0.538
12	1752.0	1.139	232.3	0.581
13	1739.6	1.131	291.6	0.729
14	1723.3	1.120	294.0	0.735
15	1717.0	1.116	275.8	0.690
16	1730.2	1.124	306.6	0.766
17	1740.5	1.131	261.7	0.654
18	1736.6	1.129	230.7	0.577
19	1736.6	1.129	294.0	0.735
20	1744.0	1.133	428.1	1.070
21	1748.0	1.136	564.9	1.412
22	1733.6	1.127	661.0	1.653
23	1715.6	1.115	498.8	1.247

Cruise: TBAC Station: LTB4-1 date: 4 JUN 95
lat: 27-33.OO N long: 82-40.00 W depth: 5 m

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.8 deg C 82.60 delta-t 290.6 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1535.5	0.998	0.0	0.000
0	1768.1	1.149	233.8	0.585
1	1727.5	1.123	210.5	0.526
2	1697.3	1.103	181.5	0.454
3	1689.8	1.098	205.3	0.513
4	1689.3	1.098	223.2	0.558
5	1711.6	1.112	240.3	0.601
6	1739.9	1.131	210.5	0.526
7	1748.3	1.136	204.0	0.510
8	1748.8	1.137	207.9	0.520
9	1741.8	1.132	206.6	0.516
10	1737.4	1.129	256.0	0.640
11	1729.5	1.124	271.7	0.679
12	1750.3	1.138	261.7	0.654
13	1747.3	1.136	261.7	0.654

Cruise: TBAC Station: LTB4-2 date: 4 JUN 95
lat: 27-33.00 N long: 82-40.00 W depth: 5 m

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.8 deg C 82.61 delta-t 290.6 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.0	0.999	0.0	0.000
0	1544.4	1.004	64.8	0.162
1	1658.6	1.078	202.7	0.507
2	1676.8	1.090	263.6	0.659
3	1733.4	1.127	267.6	0.669
4	1742.3	1.132	213.3	0.533
5	1755.9	1.141	223.2	0.558
6	1772.2	1.152	201.4	0.504
7	1771.7	1.151	226.1	0.565
8	1750.3	1.138	286.9	0.717
9	1739.9	1.131	340.7	0.852
10	1730.5	1.125	498.8	1.247
11	1715.4	1.115	749.9	1.875
14	1675.4	1.089	779.3	1.948
15	1678.2	1.091	526.8	1.317
16	1685.1	1.095	465.1	1.163
17	1678.6	1.091	434.4	1.086
18	1658.6	1.078	530.0	1.325
19	1674.5	1.088	613.5	1.534
20	1704.4	1.108	390.3	0.976

Cruise: TBAC **Station: LTB4-3** **date: 4 JUN 95**
lat: 27-33.00 N **long: 82-40.00 W** **depth: 5 m**

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.8 deg C 82.64 delta-t 290.6 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1540.1	1.001	0.0	0.000
0	1653.6	1.075	88.4	0.221
1	1646.5	1.070	201.4	0.504
2	1673.6	1.088	370.4	0.926
3	1687.9	1.097	218.8	0.547
4	1678.6	1.091	227.7	0.569
5	1700.6	1.105	259.8	0.649
6	1695.9	1.102	259.8	0.649
7	1708.2	1.110	291.6	0.729
8	1711.1	1.112	271.7	0.679
9	1675.9	1.089	229.2	0.573
10	1667.2	1.084	271.7	0.679
11	1666.7	1.083	351.1	0.878
12	1732.0	1.126	706.8	1.767
13	1679.1	1.091	602.6	1.507
14	1684.2	1.095	463.0	1.158
15	1687.4	1.097	536.4	1.341
16	1697.3	1.103	448.0	1.120

Cruise: TBAC **Station: LTB4-4** **date: 4 JUN 95**
lat: 27-33.00 N **long: 82-40.00 W** **depth: 5 m**

calc for: 27.7 deg C 34.0 o/oo 5.0 m 400 kHz
ref core: 26.9 deg C 82.59 delta-t 290.6 H 0.001 V/D
smp core: 34.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1537.0	0.999	0.0	0.000
0	1651.4	1.073	127.4	0.319
1	1712.1	1.113	265.6	0.664
2	1698.3	1.104	184.2	0.461
3	1688.4	1.097	209.2	0.523
4	1695.0	1.102	257.9	0.645
5	1702.1	1.106	213.3	0.533
6	1733.5	1.127	320.4	0.801
7	1762.5	1.145	200.2	0.500
8	1760.5	1.144	201.4	0.504

Cruise: TBAC Station: LTB5-1 date: 6 JUN 95
lat: 27-32.99 N long: 82-39.99 W depth: 4 m

calc for: 27.9 deg C 33.0 o/oo 4.0 m 400 kHz
ref core: 27.0 deg C 82.62 delta-t 303.1 H 0.001 V/D
smp core: 33.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1538.3	1.000	4.5	0.011
0	1546.9	1.006	143.1	0.358
1	1677.8	1.091	223.4	0.559
2	1677.8	1.091	219.3	0.548
3	1687.6	1.097	239.8	0.600
4	1690.9	1.099	258.4	0.646
5	1717.0	1.116	299.9	0.750
6	1740.5	1.132	297.6	0.744
7	1747.0	1.136	269.6	0.674

Cruise: TBAC Station: LTB5-2 date: 6 JUN 95
lat: 27-32.99 N long: 82-39.99 W depth: 4 m

calc for: 27.9 deg C 33.0 o/oo 4.0 m 400 kHz
ref core: 26.0 deg C 82.52 delta-t 303.1 H 0.001 V/D
smp core: 33.0 o/oo 6.1 cm thickness

Depth (cm)	Vp(m/SEC)	Vp RATIO	ALPHA(dB/m)	k
-1	1534.0	0.997	0.0	0.000
0	1536.3	0.999	195.7	0.489
1	1655.3	1.076	226.3	0.566
2	1691.4	1.100	288.4	0.721
3	1694.2	1.102	202.5	0.506
4	1678.0	1.091	262.0	0.655
5	1681.7	1.093	253.1	0.633
6	1692.4	1.100	251.4	0.628
7	1691.0	1.099	265.8	0.664
8	1697.5	1.104	315.2	0.788
9	1706.1	1.109	341.7	0.854
10	1710.4	1.112	372.3	0.931
11	1694.7	1.102	406.1	1.015
12	1697.5	1.104	477.1	1.193
13	1685.4	1.096	351.8	0.879
14	1670.6	1.086	428.0	1.070

3.1.2 Dry Tortugas Physical and Geoacoustic Properties

Figure 3.1.2.1 depicts the depth profiles of compressional wave velocity, attenuation, porosity, and mean grain size.

Section 3.1.2 contains physical and geoacoustic property data including compressional wave velocity, velocity ratio, attenuation, porosity, density, void ratio, and grain size from the following cores:

KW-PL-94-1
KW-PL-94-2
KW-PL-99-1
KW-PL-99-2
KW-PL-113-1
KW-PL-113-2
KW-PL-173-1
KW-PL-173-2
KW-PL-192-1
KW-PL-192-2
KW-PL-198-1
KW-PL-198-2
KW-PL-208-1
KW-PL-208-2
KW-PL-215-1
KW-PL-219
KW-PL-221
KW-PL-223
KW-PL-228
KW-PL-244-1
KW-PL-244-2
KW-PL-263

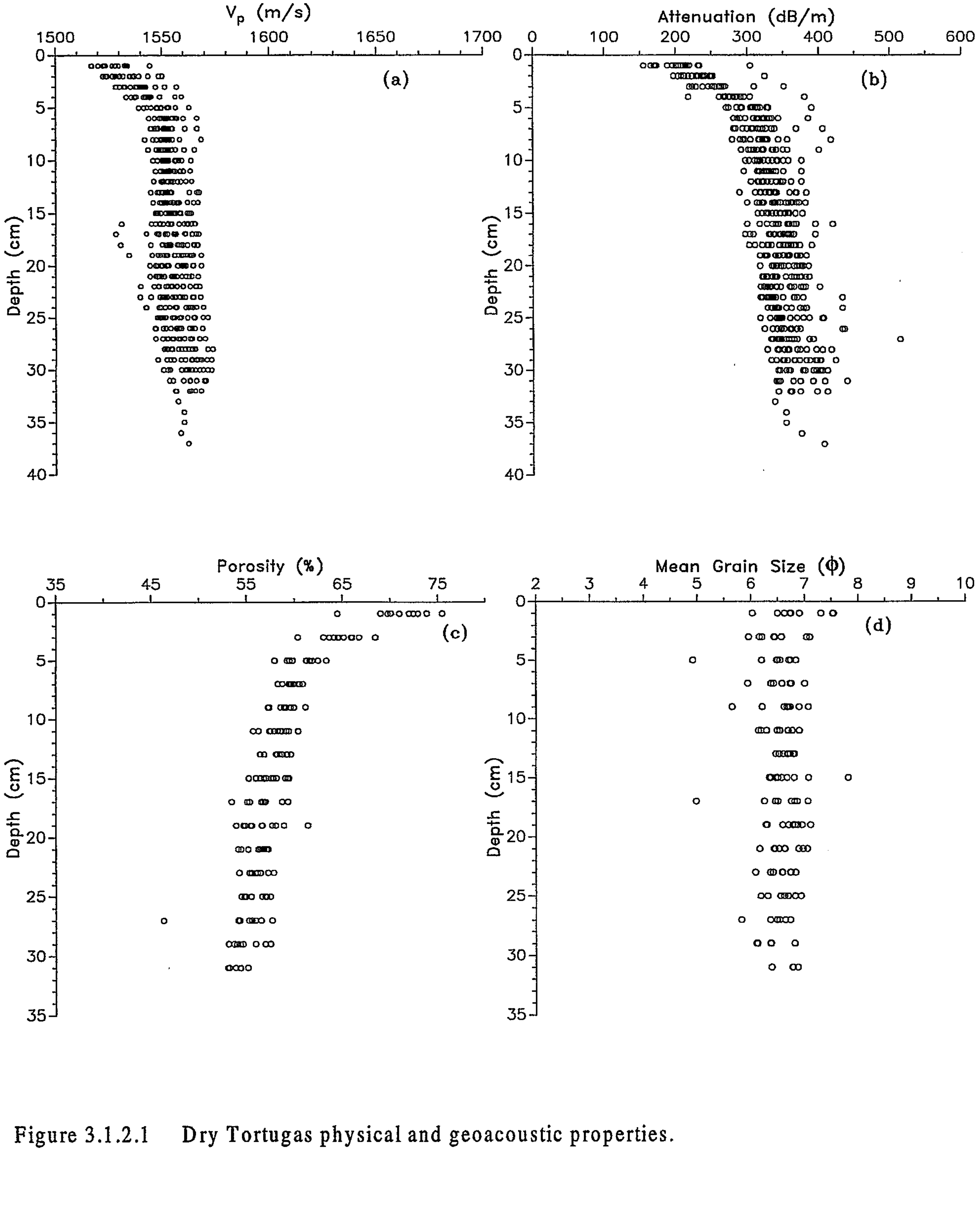


Figure 3.1.2.1 Dry Tortugas physical and geoacoustic properties.

Cruise: Planet   Station: KWPL 94-1   date: 11 Feb 95
lat: 24-36.80 N   long: 82-50.89 W   depth: 26 m

calc for: 21.0 deg C   36.0 o/oo   26.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1516.8	0.995	170.0	0.425	75.50	1.46	3.08						
2	1523.7	0.999	197.1	0.493									
3	1528.3	1.002	223.8	0.560	68.45	1.58	2.17						
4	1535.7	1.007	261.0	0.653									
5	1547.4	1.015	314.6	0.786	61.65	1.70	1.61						
6	1549.0	1.016	314.6	0.786									
7	1544.7	1.013	299.9	0.750	60.40	1.73	1.53						
8	1541.9	1.011	279.1	0.698									
9	1543.5	1.012	291.7	0.729	61.18	1.72	1.58						
10	1545.8	1.014	302.7	0.757									
11	1547.0	1.014	314.6	0.786	60.41	1.73	1.53						
12	1546.2	1.014	305.6	0.764									
13	1544.7	1.013	289.1	0.723	59.26	1.75	1.45						
14	1549.8	1.016	320.9	0.802									
15	1547.0	1.014	345.6	0.864	59.07	1.75	1.44						
16	1531.0	1.004	419.6	1.049									
17	1528.3	1.002	308.5	0.771	56.88	1.79	1.32						
18	1530.6	1.004	320.9	0.802									
19	1534.5	1.006	370.8	0.927	61.41	1.71	1.59						
20	1550.2	1.016	341.8	0.854									
21	1551.0	1.017	338.1	0.845	57.23	1.79	1.34						
22	1548.6	1.015	331.0	0.827									
23	1549.0	1.016	349.5	0.874	56.51	1.80	1.30						
24	1549.4	1.016	338.1	0.845									
25	1555.8	1.020	317.7	0.794	57.51	1.78	1.35						
26	1556.6	1.021	341.8	0.854									
27	1555.0	1.020	341.8	0.854	57.70	1.78	1.36						
28	1552.6	1.018	341.8	0.854									
29	1555.4	1.020	366.3	0.916	55.97	1.82	1.27						
30	1559.0	1.022	357.6	0.894									

Cruise: Planet   Station:KWPL 94-2   date: 11 Feb 95
lat: 24-36.80 N   long: 82-50.89 W   depth: 26 m

calc for: 21.0 deg C 36.0 o/oo   26.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1516.8	0.995	165.4	0.414									
2	1522.5	0.998	217.9	0.545									
3	1528.7	1.002	219.5	0.549									
4	1533.3	1.005	217.9	0.545									
5	1539.2	1.009	274.1	0.685									
6	1543.9	1.012	286.1	0.715									
7	1546.6	1.014	293.8	0.734									
8	1549.8	1.016	296.4	0.741									
9	1551.8	1.017	310.5	0.776									
10	1553.0	1.018	329.6	0.824									
11	1556.2	1.020	340.1	0.850									
12	1557.4	1.021	340.1	0.850									
13	1552.2	1.018	326.2	0.816									
14	1549.0	1.016	313.5	0.784									
15	1551.8	1.017	329.6	0.824									
16	1554.6	1.019	340.1	0.850									
17	1552.6	1.018	333.0	0.832									
18	1551.8	1.017	329.6	0.824									
19	1555.8	1.020	355.5	0.889									
20	1552.2	1.018	340.1	0.850									
21	1548.6	1.015	326.2	0.816									
22	1551.8	1.017	333.0	0.832									
23	1555.8	1.020	333.0	0.832									
24	1556.6	1.021	343.8	0.860									
25	1558.2	1.022	340.1	0.850									
26	1557.0	1.021	347.6	0.869									
27	1555.4	1.020	333.0	0.832									
28	1559.0	1.022	351.5	0.879									
29	1564.2	1.026	387.3	0.968									
30	1561.0	1.024	377.5	0.944									

Cruise: Planet   Station: KWPL 99-1   date: 12 Feb 95
lat: 24-36.80 N   long: 82-50.89 W   depth: 26 m

calc for: 21.0 deg C 36.0 o/oo   26.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1527.9	1.002	219.5	0.549	70.10	1.55	2.34						
2	1537.2	1.008	241.4	0.604									
3	1540.3	1.010	267.4	0.668	63.64	1.66	1.75						
4	1543.9	1.012	283.6	0.709									
5	1547.8	1.015	307.6	0.769	61.29	1.71	1.58						
6	1551.0	1.017	322.9	0.807									
7	1548.2	1.015	316.6	0.792	59.74	1.74	1.48						
8	1545.8	1.014	304.7	0.762									
9	1548.6	1.015	301.9	0.755	59.05	1.75	1.44						
10	1550.6	1.017	313.5	0.784									
11	1550.6	1.017	316.6	0.792	58.74	1.76	1.42						
12	1550.2	1.016	316.6	0.792									
13	1550.2	1.016	319.7	0.799	59.17	1.75	1.45						
14	1551.4	1.017	322.9	0.807									
15	1553.8	1.019	329.6	0.824	58.13	1.77	1.39						
16	1553.0	1.018	343.8	0.860									
17	1548.6	1.015	336.5	0.841	56.56	1.80	1.30						
18	1544.7	1.013	310.5	0.776									
19	1545.4	1.013	326.2	0.816	58.05	1.77	1.38						
20	1549.4	1.016	347.6	0.869									
21	1549.8	1.016	322.9	0.807	57.29	1.79	1.34						
22	1551.8	1.017	340.1	0.850									
23	1551.0	1.017	336.5	0.841	56.17	1.81	1.28						
24	1548.6	1.015	333.0	0.832									
25	1547.8	1.015	343.8	0.860	57.15	1.79	1.33						
26	1546.6	1.014	368.3	0.921									
27	1550.2	1.016	347.6	0.869	56.53	1.80	1.30						
28	1551.0	1.017	343.8	0.860									
29	1552.2	1.018	333.0	0.832	57.50	1.79	1.35						
30	1550.6	1.017	359.6	0.899									
31	1555.0	1.020	363.9	0.910	55.14	1.83	1.23						
32	1556.2	1.020	359.6	0.899									

Cruise: Planet Station: KWPL 99-2 date: 12 Feb 95
lat: 24-36.80 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1526.8	1.001	215.5	0.539									
2	1534.9	1.006	239.0	0.598									
3	1541.5	1.011	267.2	0.668									
4	1544.3	1.013	286.2	0.716									
5	1549.4	1.016	311.2	0.778									
6	1546.6	1.014	281.2	0.703									
7	1545.0	1.013	281.2	0.703									
8	1547.4	1.015	294.1	0.735									
9	1549.8	1.016	305.2	0.763									
10	1552.2	1.018	314.2	0.786									
11	1551.4	1.017	314.2	0.786									
12	1551.0	1.017	314.2	0.786									
13	1550.6	1.017	311.2	0.778									
14	1552.6	1.018	317.4	0.793									
15	1555.8	1.020	320.6	0.801									
16	1554.2	1.019	317.4	0.793									
17	1555.8	1.020	330.6	0.827									
18	1554.2	1.019	357.3	0.893									
19	1556.2	1.020	357.3	0.893									
20	1557.4	1.021	341.4	0.854									
21	1555.8	1.020	341.4	0.854									
22	1554.2	1.019	375.1	0.938									
23	1555.0	1.020	365.9	0.915									
24	1551.4	1.017	334.1	0.835									
25	1549.4	1.016	345.2	0.863									
26	1551.8	1.017	323.8	0.810									
27	1554.6	1.019	345.2	0.863									
28	1552.2	1.018	357.3	0.893									
29	1553.8	1.019	349.1	0.873									
30	1552.6	1.018	345.2	0.863									
31	1553.4	1.019	345.2	0.863									
32	1556.6	1.021	361.5	0.904									
33	1557.4	1.021	337.7	0.844									
34	1560.2	1.023	353.2	0.883									
35	1560.2	1.023	353.2	0.883									
36	1558.6	1.022	375.1	0.938									

Cruise: Planet Station: KWPL 113-1 date: 13 Feb 95
lat: 24-36.81 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1517.2	0.995	155.1	0.388									
2	1524.4	1.000	208.3	0.521									
3	1530.2	1.003	228.8	0.572									
4	1537.2	1.008	261.0	0.653									
5	1547.8	1.015	311.5	0.779									
6	1551.4	1.017	324.2	0.810									
7	1550.6	1.017	308.5	0.771									
8	1552.2	1.018	327.5	0.819									
9	1549.8	1.016	320.9	0.802									
10	1551.0	1.017	314.6	0.786									
11	1551.8	1.017	317.7	0.794									
12	1553.0	1.018	320.9	0.802									
13	1548.6	1.015	317.7	0.794									
14	1545.8	1.014	299.9	0.750									
15	1548.2	1.015	314.6	0.786									
16	1547.0	1.014	299.9	0.750									
17	1556.6	1.021	297.1	0.743									
18	1559.8	1.023	302.7	0.757									
19	1552.6	1.018	317.7	0.794									
20	1544.3	1.013	317.7	0.794									
21	1544.3	1.013	320.9	0.802									
22	1539.9	1.010	327.5	0.819									
23	1539.6	1.009	320.9	0.802									
24	1542.3	1.011	341.8	0.854									
25	1548.6	1.015	341.8	0.854									

Cruise: Planet   Station: KWPL 113-2   date: 13 Feb 95
lat: 24-36.81 N   long: 82-50.89 W   depth: 26 m

calc for: 21.0 deg C 36.0 o/oo   26.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1522.5	0.998	195.8	0.489	73.87	1.48	2.83	0.00	19.71	43.07	37.21	6.91	3.41
2	1527.1	1.001	212.4	0.531									
3	1532.9	1.005	238.0	0.595	64.54	1.64	1.82	0.03	28.45	38.84	32.68	6.44	3.47
4	1543.9	1.012	295.8	0.739									
5	1549.8	1.016	318.6	0.796	59.81	1.73	1.49	0.05	32.99	35.32	31.63	6.20	3.52
6	1549.8	1.016	321.7	0.804									
7	1547.4	1.015	315.5	0.789	58.75	1.76	1.42	0.08	33.76	36.24	29.92	6.38	3.64
8	1549.4	1.016	324.9	0.812									
9	1554.2	1.019	335.0	0.837	57.37	1.78	1.35	0.48	24.61	41.75	33.16	6.70	3.51
10	1553.0	1.018	335.0	0.837									
11	1553.0	1.018	331.6	0.829	57.42	1.79	1.35	0.06	36.54	34.81	28.58	6.19	3.71
12	1555.4	1.020	349.6	0.874									
13	1553.8	1.019	338.5	0.846	58.12	1.77	1.39	1.00	28.56	37.72	32.72	6.46	3.76
14	1551.0	1.017	335.0	0.837									
15	1549.4	1.016	335.0	0.837	56.45	1.80	1.30	0.07	27.95	41.42	30.56	6.57	3.57
16	1550.6	1.017	335.0	0.837									
17	1551.4	1.017	338.5	0.846	56.92	1.79	1.32	1.91	27.73	40.89	29.48	6.45	3.78
18	1552.6	1.018	353.5	0.884									
19	1551.8	1.017	374.8	0.937	56.67	1.80	1.31	1.01	22.03	41.41	35.54	6.82	3.55
20	1547.0	1.014	357.5	0.894									
21	1547.8	1.015	335.0	0.837	56.88	1.79	1.32	0.36	21.98	39.95	37.70	6.89	3.51
22	1546.2	1.014	318.6	0.796									
23	1544.7	1.013	318.6	0.796	57.28	1.79	1.34	0.15	23.06	40.27	36.53	6.83	3.47
24	1548.6	1.015	328.2	0.820									
25	1549.0	1.016	331.6	0.829	57.06	1.79	1.33	0.34	25.92	37.73	36.02	6.69	3.53
26	1547.0	1.014	335.0	0.837									
27	1552.2	1.018	357.5	0.894	54.32	1.85	1.19	0.54	30.00	35.25	34.21	6.49	3.75

Cruise: Planet Station: KWPL 173-1 date: 18 Feb 95
lat: 24-36.24 N long: 82-51.18 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.0	1.002	188.5	0.471	69.03	1.57	2.23	0.05	31.13	36.86	31.95	6.50	3.74
2	1536.4	1.007	237.1	0.593									
3	1540.3	1.010	264.6	0.662	64.14	1.65	1.79	0.13	30.78	34.45	34.64	6.57	3.87
4	1542.6	1.011	280.7	0.702									
5	1548.1	1.015	306.2	0.766	59.48	1.74	1.47	0.09	35.62	33.12	31.17	6.50	4.06
6	1552.4	1.018	316.8	0.792									
7	1553.2	1.018	306.2	0.766	59.43	1.74	1.46	0.51	33.11	31.84	34.55	6.37	3.80
8	1553.6	1.019	316.8	0.792									
9	1554.4	1.019	340.6	0.851	58.57	1.76	1.41	0.11	28.45	38.36	33.08	6.62	3.76
10	1556.0	1.020	350.6	0.877									
11	1560.0	1.023	350.6	0.877	56.29	1.80	1.29	0.39	41.62	24.31	33.68	6.29	4.37
12	1558.8	1.022	350.6	0.877									
13	1562.8	1.025	369.1	0.923	56.43	1.80	1.30	0.32	32.46	28.22	39.00	6.81	4.01
14	1564.8	1.026	381.5	0.954									
15	1562.8	1.025	377.3	0.943	55.99	1.81	1.27	0.13	48.79	16.29	34.79	6.34	4.42
16	1564.0	1.025	357.7	0.894									
17	1567.2	1.028	365.2	0.913	55.34	1.82	1.24	15.19	24.10	30.22	30.49	4.98	5.24
18	1566.8	1.027	390.4	0.976									
19	1559.2	1.022	369.1	0.923	55.56	1.82	1.25	1.99	35.18	29.93	32.90	6.30	4.27
20	1559.6	1.023	385.9	0.965									
21	1556.8	1.021	381.5	0.954	56.32	1.80	1.29	2.81	31.63	30.95	34.62	6.45	4.08
22	1556.8	1.021	381.5	0.954									
23	1550.1	1.016	432.9	1.082	57.84	1.78	1.37	0.47	43.48	25.87	30.18	6.08	4.14
24	1542.6	1.011	432.9	1.082									
25	1550.5	1.017	404.9	1.012	54.97	1.83	1.22	3.79	36.00	28.46	31.75	6.18	4.21
26	1550.5	1.017	432.9	1.082									
27	1546.9	1.014	514.2	1.285	54.17	1.84	1.18	6.92	36.51	25.04	31.52	5.82	4.61
28	1554.8	1.019	404.9	1.012									
29	1558.8	1.022	395.1	0.988	53.71	1.86	1.16	1.70	41.50	24.61	32.20	6.12	4.21
30	1561.6	1.024	404.9	1.012									
31	1566.0	1.027	439.3	1.098	53.20	1.87	1.14	0.76	36.46	29.84	32.94	6.38	3.96

Cruise: Planet Station: KWPL 173-2 date: 18 Feb 95
lat: 24-36.24 N long: 82-51.18 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1529.6	1.003	217.2	0.543									
2	1535.0	1.006	231.9	0.580									
3	1540.8	1.010	261.0	0.653									
4	1544.3	1.013	285.8	0.715									
5	1547.8	1.015	305.2	0.763									
6	1551.7	1.017	313.2	0.783									
7	1553.3	1.018	321.6	0.804									
8	1552.1	1.018	315.9	0.790									
9	1552.9	1.018	313.2	0.783									
10	1553.3	1.018	318.8	0.797									
11	1553.3	1.018	327.6	0.819									
12	1552.5	1.018	333.8	0.834									
13	1551.7	1.017	324.6	0.811									
14	1555.3	1.020	357.8	0.895									
15	1555.3	1.020	347.0	0.868									
16	1565.3	1.026	365.5	0.914									
17	1566.1	1.027	365.5	0.914									
18	1565.3	1.026	361.6	0.904									
19	1564.0	1.026	373.7	0.934									
20	1564.4	1.026	373.7	0.934									
21	1566.9	1.027	373.7	0.934									
22	1566.1	1.027	365.5	0.914									
23	1564.4	1.026	377.9	0.945									
24	1562.4	1.024	382.3	0.956									
25	1565.3	1.026	406.5	1.016									
26	1564.0	1.026	435.7	1.089									
27	1567.7	1.028	365.5	0.914									
28	1564.4	1.026	396.3	0.991									
29	1568.5	1.028	423.3	1.058									
30	1571.3	1.030	411.9	1.030									

Cruise: Planet   Station: KWPL 192-1   date: 20 Feb 95
lat: 24-36.56 N   long: 82-51.53 W   depth: 25 m

calc for: 21.0 deg C   36.0 o/oo   25.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1520.1	0.997	173.1	0.433									
2	1529.6	1.003	231.3	0.578									
3	1537.6	1.008	255.1	0.638									
4	1542.7	1.012	274.9	0.687									
5	1549.7	1.016	293.0	0.733									
6	1560.0	1.023	331.6	0.829									
7	1560.8	1.023	338.1	0.845									
8	1554.9	1.020	328.5	0.821									
9	1553.3	1.018	313.8	0.784									
10	1556.8	1.021	322.4	0.806									
11	1558.4	1.022	328.5	0.821									
12	1554.5	1.019	328.5	0.821									
13	1553.7	1.019	319.5	0.799									
14	1558.0	1.022	338.1	0.845									
15	1562.0	1.024	352.0	0.880									
16	1561.6	1.024	359.5	0.899									
17	1564.4	1.026	344.9	0.862									
18	1566.4	1.027	344.9	0.862									
19	1568.4	1.028	344.9	0.862									
20	1568.4	1.028	334.8	0.837									
21	1566.8	1.027	328.5	0.821									
22	1565.6	1.027	328.5	0.821									
23	1564.8	1.026	334.8	0.837									
24	1561.2	1.024	328.5	0.821									
25	1564.8	1.026	359.5	0.899									
26	1558.0	1.022	359.5	0.899									
27	1558.4	1.022	344.9	0.862									
28	1560.8	1.023	355.7	0.889									
29	1560.8	1.023	355.7	0.889									
30	1562.4	1.024	380.2	0.950									

Cruise: Planet Station: KWPL 192-2 date: 20 Feb 95
lat: 24-36.56 N long: 82-51.53 W depth: 25 m

calc for: 21.0 deg C 36.0 o/oo 25.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1533.4	1.005	231.9	0.580	70.05	1.55	2.34	0.00	28.47	38.74	32.78	6.73	3.81
2	1539.2	1.009	250.1	0.625									
3	1542.3	1.011	261.0	0.653	63.06	1.67	1.71	0.69	37.24	31.84	30.22	6.16	3.99
4	1541.5	1.011	266.8	0.667									
5	1541.5	1.011	270.8	0.677	61.23	1.71	1.58	0.00	26.05	39.94	34.01	6.71	3.61
6	1546.6	1.014	290.4	0.726									
7	1548.2	1.015	283.6	0.709	59.57	1.74	1.47	0.07	31.86	34.92	33.15	6.58	3.89
8	1549.7	1.016	290.4	0.726									
9	1550.5	1.017	310.5	0.776	58.91	1.76	1.43	0.22	27.51	34.72	37.55	6.90	3.97
10	1547.8	1.015	297.6	0.744									
11	1549.3	1.016	295.2	0.738	59.41	1.75	1.46	0.00	31.15	35.27	33.58	6.53	3.71
12	1549.7	1.016	305.2	0.763									
13	1552.9	1.018	337.0	0.842	58.47	1.76	1.41	0.46	32.51	32.38	34.65	6.60	3.81
14	1556.8	1.021	354.1	0.885									
15	1558.8	1.022	340.2	0.851	57.07	1.79	1.33	1.23	34.88	32.69	31.20	6.50	3.90
16	1563.6	1.025	357.8	0.895									
17	1564.0	1.026	347.0	0.868	55.08	1.82	1.23	0.14	27.88	36.94	35.04	6.75	3.85
18	1562.0	1.024	333.8	0.834									
19	1563.2	1.025	340.2	0.851	54.86	1.83	1.22	0.00	27.66	36.45	35.90	6.70	3.86
20	1561.2	1.024	337.0	0.842									
21	1562.8	1.025	340.2	0.851	54.16	1.84	1.18	0.00	29.61	37.50	32.89	6.52	3.78
22	1567.6	1.028	327.6	0.819									
23	1568.0	1.028	330.6	0.827	54.26	1.84	1.19	0.68	31.00	34.82	33.50	6.59	3.90
24	1564.4	1.026	340.2	0.851									
25	1562.0	1.024	347.0	0.868	54.50	1.83	1.20						
26	1562.8	1.025	361.6	0.904									
27	1563.2	1.025	343.6	0.859	54.16	1.84	1.18						
28	1557.6	1.021	327.6	0.819									
29	1558.8	1.022	340.2	0.851	53.14	1.87	1.13						
30	1560.8	1.023	354.1	0.885									
31	1560.0	1.023	340.2	0.851	53.85	1.85	1.17						
32	1562.8	1.025	373.7	0.934									

Cruise: Planet Station: KWPL 198-1 date: 21 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz
ref core: 20.0 deg C 82.17 delta-t 469.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1532.7	1.005	233.5	0.584	70.98	1.53	2.45	0.00	31.00	34.25	34.75	6.75	4.18
2	1537.3	1.008	250.1	0.625									
3	1539.6	1.010	261.0	0.653	65.15	1.64	1.87	0.05	32.16	37.87	29.91	6.45	3.72
4	1544.7	1.013	283.6	0.709									
5	1547.8	1.015	285.8	0.715	61.57	1.70	1.60	0.00	32.65	39.60	27.76	6.48	3.73
6	1549.0	1.016	297.6	0.744									
7	1551.3	1.017	318.8	0.797	60.55	1.72	1.53	0.14	24.22	42.97	32.66	6.74	3.57
8	1551.3	1.017	321.6	0.804									
9	1551.3	1.017	321.6	0.804	59.95	1.74	1.50	0.10	27.15	42.00	30.75	6.67	3.60
10	1552.9	1.018	310.5	0.776									
11	1554.5	1.019	327.6	0.819	57.88	1.78	1.37	0.15	28.38	38.88	32.59	6.54	3.56
12	1552.5	1.018	315.9	0.790									
13	1554.5	1.019	318.8	0.797	58.66	1.76	1.42	0.14	23.10	42.66	34.09	6.79	3.54
14	1554.1	1.019	340.2	0.851									
15	1554.5	1.019	340.2	0.851	56.84	1.79	1.32	0.03	27.73	36.95	35.29	6.67	3.67
16	1554.1	1.019	340.2	0.851									
17	1555.7	1.020	357.8	0.895	56.72	1.80	1.31	0.36	35.35	34.18	30.11	6.50	3.86
18	1557.3	1.021	373.7	0.934									
19	1550.9	1.017	350.5	0.876	56.58	1.80	1.30	0.65	34.63	32.96	31.76	6.28	3.94
20	1549.8	1.016	347.0	0.868									
21	1554.9	1.020	361.6	0.904	56.46	1.80	1.30	0.16	35.37	32.44	32.03	6.43	3.93
22	1557.3	1.021	361.6	0.904									
23	1556.5	1.021	369.5	0.924	55.32	1.82	1.24	2.81	32.98	32.12	32.08	6.41	4.10
24	1556.9	1.021	382.3	0.956									
25	1555.7	1.020	377.9	0.945	55.49	1.82	1.25	0.45	29.36	40.28	29.91	6.55	3.82
26	1557.3	1.021	373.7	0.934									
27	1557.7	1.021	386.8	0.967	55.96	1.81	1.27	0.84	33.47	34.22	31.47	6.36	3.80
28	1564.0	1.026	417.5	1.044									
29	1566.9	1.027	382.3	0.956	54.37	1.85	1.19	2.33	36.23	33.52	27.91	6.10	3.92
30	1564.0	1.026	401.3	1.003									
31	1562.8	1.025	391.5	0.979	54.40	1.85	1.19	0.70	27.07	33.37	38.86	6.78	3.72
32	1565.7	1.027	411.9	1.030									

Cruise: Planet   Station: KWPL 198-2   date: 21 Feb 95
lat: 24-36.70 N   long: 82-50.71 W   depth: 27 m

calc for: 21.0 deg C 36.0 o/oo   27.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1523.5	0.999	214.5	0.536									
2	1535.4	1.007	251.8	0.630									
3	1540.0	1.010	261.0	0.653									
4	1543.9	1.012	285.8	0.715									
5	1552.5	1.018	327.6	0.819									
6	1557.3	1.021	343.6	0.859									
7	1554.9	1.020	333.8	0.834									
8	1552.9	1.018	343.6	0.859									
9	1556.5	1.021	350.5	0.876									
10	1558.1	1.022	357.8	0.895									
11	1554.1	1.019	337.0	0.842									
12	1550.9	1.017	347.0	0.868									
13	1552.9	1.018	330.6	0.827									
14	1555.3	1.020	337.0	0.842									
15	1553.7	1.019	357.8	0.895									
16	1549.4	1.016	327.6	0.819									
17	1556.5	1.021	350.5	0.876									
18	1553.7	1.019	350.5	0.876									
19	1549.4	1.016	324.6	0.811									
20	1552.9	1.018	365.5	0.914									
21	1559.3	1.022	386.8	0.967									
22	1563.2	1.025	401.3	1.003									
23	1560.9	1.023	365.5	0.914									
24	1563.6	1.025	354.1	0.885									
25	1564.8	1.026	386.8	0.967									
26	1568.9	1.029	369.5	0.924									
27	1564.0	1.026	391.5	0.979									
28	1562.4	1.024	396.3	0.991									
29	1566.1	1.027	401.3	1.003									
30	1567.7	1.028	396.3	0.991									

Cruise: Planet Station: KWPL 208-1 date: 22 Feb 95
lat: 24-44.98 N long: 82-12.09 W depth: 22 m

calc for: 20.0 deg C 36.0 o/oo 22.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1548.6	1.017	278.2	0.696	63.68	1.66	1.75	0.00	25.96	38.26	35.78	6.61	3.80
2	1543.8	1.014	241.9	0.605									
3	1543.1	1.014	245.5	0.614	61.05	1.70	1.57	0.21	31.44	39.15	29.21	6.38	3.86
4	1546.6	1.016	260.9	0.652									
5	1553.7	1.021	295.3	0.738	58.83	1.74	1.43	0.28	24.18	37.84	37.70	6.72	3.67
6	1552.5	1.020	306.0	0.765									
7	1552.1	1.020	311.7	0.779	51.35	1.87	1.06	0.18	26.74	42.20	30.87	6.64	3.88
8	1551.7	1.019	300.6	0.751									
9	1550.1	1.018	297.9	0.745	58.99	1.74	1.44	0.39	22.14	43.98	33.49	6.77	3.73
10	1546.6	1.016	297.9	0.745									
11	1543.4	1.014	308.9	0.772	58.29	1.75	1.40	1.08	25.17	37.70	36.05	6.63	3.84
12	1552.1	1.020	333.7	0.834									
13	1556.5	1.022	333.7	0.834	57.07	1.77	1.33	1.37	24.61	38.55	35.47	6.53	4.03
14	1554.9	1.021	317.7	0.794									
15	1551.3	1.019	363.8	0.909	58.20	1.75	1.39	4.37	28.48	35.83	31.32	6.05	4.35
16	1553.7	1.021	402.0	1.005									
17	1551.7	1.019	363.8	0.909	54.80	1.81	1.21	4.67	22.21	38.99	34.13	6.55	4.17
18	1553.3	1.020	344.2	0.861									
19	1549.0	1.017	311.7	0.779	55.61	1.79	1.25	6.06	27.40	31.92	34.62	5.84	4.51

Cruise: Planet Station: KWPL 208-2 date: 22 Feb 95
lat: 24-44.98 N long: 82-12.09 W depth: 22 m

calc for: 20.0 deg C 36.0 o/oo 22.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1542.0	1.013	253.2	0.633									
2	1557.8	1.023	341.1	0.853									
3	1555.4	1.022	324.7	0.812									
4	1550.2	1.018	284.6	0.711									
5	1553.0	1.020	296.7	0.742									
6	1554.2	1.021	301.9	0.755									
7	1550.6	1.019	289.3	0.723									
8	1551.0	1.019	284.6	0.711									
9	1553.8	1.021	312.9	0.782									
10	1553.0	1.020	331.1	0.828									
11	1555.4	1.022	341.1	0.853									
12	1557.4	1.023	355.7	0.889									
13	1557.4	1.023	351.9	0.880									
14	1558.6	1.024	376.4	0.941									
15	1553.8	1.021	429.8	1.074									
16	1548.6	1.017	411.6	1.029									
17	1545.9	1.015	484.3	1.211									
18	1547.5	1.016	494.1	1.235									

Cruise: Planet Station: KWPL 215-1 date: 22 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1544.4	1.013	304.6	0.761	64.49	1.66	1.82	0.12	38.84	32.14	28.90	6.03	3.79
2	1550.3	1.016	324.7	0.812									
3	1557.0	1.021	351.9	0.880	60.35	1.74	1.52	0.00	44.89	28.12	27.00	5.96	3.97
4	1559.4	1.022	380.9	0.952									
5	1556.6	1.021	390.4	0.976	57.94	1.78	1.38	0.98	61.06	17.89	20.07	4.92	4.04
6	1556.6	1.021	385.6	0.964									
7	1554.6	1.019	406.0	1.015	60.86	1.73	1.55	0.00	45.52	27.88	26.60	5.94	3.80
8	1551.8	1.018	417.4	1.043									
9	1555.0	1.020	400.6	1.002	57.25	1.80	1.34	0.34	45.88	25.90	27.87	5.65	4.10
10	1559.4	1.022	376.4	0.941									
11	1555.4	1.020	376.4	0.941	55.71	1.82	1.26	0.00	36.44	30.59	32.97	6.14	3.86
12	1554.2	1.019	376.4	0.941									
13	1554.6	1.019	367.8	0.919	56.83	1.80	1.32	0.33	31.82	30.63	37.22	6.52	3.89
14	1557.4	1.021	363.7	0.909									
15	1556.6	1.021	367.8	0.919	55.24	1.83	1.23	0.32	27.58	20.14	51.96	7.81	3.76
16	1560.6	1.023	395.4	0.989									
17	1561.4	1.024	395.4	0.989	53.43	1.86	1.15	0.15	35.69	30.53	33.63	6.25	3.82
18	1559.0	1.022	367.8	0.919									
19	1557.8	1.021	359.6	0.899	53.93	1.85	1.17	1.05	35.81	19.28	43.86	6.78	3.80
20	1559.0	1.022	376.4	0.941									
21	1555.0	1.020	376.4	0.941	56.24	1.81	1.29	0.34	40.29	31.03	28.34	6.16	3.77

Cruise: Planet   Station:KWPL 219   date: 23 Feb 95
lat: 24-32.48 N   long: 82-29.32 W   depth: 14 m

calc for: 21.0 deg C 36.0 o/oo   14.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1716.6	1.126	316.8	0.792	41.25	2.07	0.70	0.98	97.7	0.46	0.85	1.05	0.68
2	1710.8	1.122	221.1	0.553									
3	1711.2	1.122	280.3	0.701	40.85	2.07	0.69	1.82	96.49	0.62	1.07	1.14	0.71
4	1731.2	1.135	280.3	0.701									
5	1731.7	1.136	202.6	0.507	40.32	2.08	0.68	2.65	96.22	0.28	0.84	0.91	0.68
6	1731.7	1.136	228.9	0.572									
7	1715.1	1.125	233.7	0.584	41.38	2.06	0.71	2.50	96.03	0.55	0.93	1.07	0.70
8	1733.7	1.137	200.0	0.500									
9	1740.1	1.141	141.8	0.355	39.86	2.09	0.66	0.41	98.23	0.45	0.92	1.18	0.53
10	1755.7	1.151	154.5	0.386									
11	1759.2	1.154	103.3	0.258	39.65	2.09	0.66	0.14	98.86	0.21	0.79	1.24	0.43
12	1750.1	1.148	117.9	0.295									
13	1739.1	1.140	130.2	0.325	40.69	2.08	0.69	0.04	98.62	0.37	0.97	1.20	0.44
14	1733.2	1.137	117.9	0.295									
15	1732.7	1.136	117.9	0.295	41.56	2.06	0.71	0.08	98.29	0.68	0.95	1.25	0.47
16	1726.8	1.132	143.6	0.359									
17	1720.4	1.128	180.5	0.451	43.17	2.03	0.76	0.65	97.88	0.42	1.05	1.25	0.52
18	1695.5	1.112	263.0	0.658									
19	1702.6	1.117	297.4	0.743	45.13	2.00	0.82	1.45	96.59	0.77	1.19	1.28	0.61
20	1720.0	1.128	212.3	0.531									
21	1726.3	1.132	205.3	0.513	42.23	2.04	0.73	1.46	97.04	0.42	1.08	1.11	0.57
22	1731.7	1.136	244.0	0.610									

Cruise: Planet Station: KWPL 221 date: 23 Feb 95
lat: 24-32.35 N long: 82-29.36 W depth: 17 m

calc for: 21.0 deg C 36.0 o/oo 17.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1645.4	1.079	355.7	0.889	45.05	2.01	0.82	2.73	93.65	1.51	2.10	1.31	0.85
2	1683.6	1.104	251.4	0.628									
3	1689.2	1.108	271.2	0.678	43.30	2.03	0.76	3.83	94.09	0.66	1.41	1.21	0.87
4	1686.4	1.106	372.0	0.930									
5	1705.3	1.118	334.3	0.836	42.07	2.05	0.73	6.81	91.23	0.85	1.12	1.14	1.04
6	1682.2	1.103	341.1	0.853									
7	1657.5	1.087	400.6	1.002	44.00	2.02	0.79	4.19	93.74	0.65	1.41	1.10	0.94
8	1728.5	1.133	614.8	1.537									
9	1712.0	1.123	348.2	0.871	42.59	2.04	0.74	3.70	94.09	0.75	1.45	1.22	0.90
10	1712.0	1.123	385.6	0.964									
11	1707.2	1.120	265.0	0.662	45.10	2.00	0.82	2.53	95.28	0.57	1.62	1.47	0.80
12	1704.3	1.118	260.9	0.652									
13	1712.0	1.123	240.7	0.602	43.83	2.02	0.78	2.08	95.58	0.76	1.58	1.43	0.78
14	1712.5	1.123	240.7	0.602									

Cruise: Planet　Station: KWPL 223　date: 23 Feb 95
lat: 24-36.70 N　long: 82-50.71 W　depth: 27 m

calc for: 21.0 deg C　36.0 o/oo　27.0 m　400 kHz

smp core:　6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1523.0	0.999	201.2	0.503	72.46	1.51	2.63	0.00	20.94	34.96	44.10	7.53	3.83
2	1526.8	1.001	223.4	0.558									
3	1532.6	1.005	251.4	0.629	66.76	1.61	2.01	0.00	22.04	39.55	38.41	7.04	3.62
4	1538.0	1.008	275.2	0.688									
5	1545.0	1.013	309.2	0.773	63.32	1.67	1.73	0.00	30.80	38.01	31.18	6.74	3.87
6	1550.9	1.017	323.6	0.809									
7	1551.7	1.017	326.6	0.817	59.66	1.74	1.48	0.00	27.96	37.31	34.73	6.75	3.83
8	1549.3	1.016	317.6	0.794									
9	1551.3	1.017	336.2	0.841	59.62	1.74	1.48	0.08	23.98	37.52	38.41	7.07	3.82
10	1553.3	1.018	343.0	0.858									
11	1549.3	1.016	326.6	0.817	58.27	1.77	1.40	0.00	27.13	37.92	34.95	6.69	3.66
12	1546.2	1.014	323.6	0.809									
13	1548.9	1.016	339.6	0.849	58.76	1.76	1.43	0.11	27.51	42.96	29.42	6.69	3.72
14	1552.1	1.018	369.7	0.924									
15	1553.3	1.018	353.8	0.885	59.29	1.75	1.46	1.16	32.18	42.18	24.49	6.37	3.93
16	1558.1	1.022	343.0	0.858									
17	1556.5	1.021	361.5	0.904	56.93	1.79	1.32	0.21	26.56	34.98	38.24	6.81	3.87
18	1554.1	1.019	365.5	0.914									
19	1548.2	1.015	343.0	0.858	58.90	1.76	1.43	0.00	25.99	36.24	37.77	6.95	3.87
20	1549.7	1.016	369.7	0.924									
21	1555.7	1.020	339.6	0.849	55.18	1.82	1.23	0.08	26.74	34.28	38.90	6.97	3.82
22	1559.7	1.023	323.6	0.809									
23	1558.5	1.022	339.6	0.849	55.51	1.82	1.25	0.21	26.77	41.91	31.12	6.73	3.85
24	1556.1	1.020	361.5	0.904									
25	1554.9	1.020	346.5	0.866	56.63	1.80	1.31	1.70	24.46	35.80	38.05	6.93	3.93
26	1554.1	1.019	346.5	0.866									
27	1552.5	1.018	353.8	0.885	55.56	1.82	1.25	0.11	28.51	34.76	36.61	6.73	3.89
28	1554.5	1.019	369.7	0.924									
29	1563.7	1.025	397.3	0.993	54.62	1.84	1.20	0.16	26.56	41.22	32.06	6.81	3.80
30	1569.3	1.029	402.5	1.006									
31	1570.5	1.030	407.9	1.020	53.04	1.87	1.13	0.00	27.06	34.33	38.61	6.87	3.82

Cruise: Planet   Station: KWPL 228   date: 23 Feb 95
lat: 24-36.70 N   long: 82-50.71 W   depth: 27 m

calc for: 21.0 deg C 36.0 o/oo   27.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.7	1.002	211.3	0.528	72.00	1.52	2.57						
2	1530.6	1.004	223.0	0.557									
3	1538.4	1.009	271.2	0.678	64.64	1.65	1.83						
4	1545.0	1.013	304.6	0.761									
5	1550.1	1.016	331.1	0.828	59.25	1.74	1.45						
6	1553.3	1.018	334.3	0.836									
7	1552.1	1.018	337.7	0.844	58.27	1.76	1.40						
8	1552.9	1.018	324.7	0.812									
9	1551.3	1.017	324.7	0.812	59.14	1.75	1.45						
10	1550.1	1.016	337.7	0.844									
11	1552.1	1.018	351.9	0.880	59.17	1.75	1.45						
12	1550.5	1.017	344.6	0.862									
13	1550.1	1.016	327.9	0.820	56.46	1.80	1.30						
14	1551.7	1.017	348.2	0.871									
15	1553.3	1.018	390.4	0.976	57.58	1.78	1.36						
16	1548.9	1.016	372.0	0.930									
17	1547.8	1.015	359.6	0.899	59.31	1.75	1.46						
18	1553.7	1.019	380.9	0.952									
19	1552.9	1.018	372.0	0.930	55.43	1.82	1.24						
20	1553.3	1.018	367.8	0.919									
21	1554.5	1.019	337.7	0.844	56.65	1.80	1.31						
22	1552.9	1.018	337.7	0.844									
23	1552.5	1.018	367.8	0.919	55.91	1.81	1.27						

Cruise: Planet Station: KWPL 244-1 date: 24 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.1	1.002	207.8	0.519	69.75	1.55	2.31	0.00	14.99	40.96	44.05	7.54	3.54
2	1531.9	1.004	229.5	0.574									
3	1535.4	1.007	246.1	0.615	65.92	1.62	1.93	0.00	33.43	40.89	25.68	6.21	3.47
4	1542.4	1.011	291.2	0.728									
5	1553.4	1.019	329.8	0.824	61.86	1.70	1.62	0.00	28.62	41.20	30.19	6.54	3.80
6	1552.2	1.018	314.8	0.787									
7	1551.0	1.017	314.8	0.787	59.89	1.74	1.49	0.00	22.33	37.01	40.66	7.00	3.53
8	1551.0	1.017	317.6	0.794									
9	1553.0	1.018	323.6	0.809	59.06	1.75	1.44	0.12	25.77	39.46	34.64	6.73	3.63
10	1551.8	1.018	323.6	0.809									
11	1551.8	1.018	323.6	0.809	58.52	1.76	1.41	0.18	23.23	44.48	32.10	6.77	3.60
12	1550.7	1.017	361.5	0.904									
13	1547.9	1.015	382.8	0.957	58.22	1.77	1.39	0.34	27.21	39.29	33.16	6.68	3.65
14	1552.2	1.018	346.5	0.866									
15	1547.5	1.015	326.6	0.817	59.43	1.75	1.46	0.12	21.30	39.58	38.99	7.07	3.56
16	1545.1	1.013	317.6	0.794									
17	1542.8	1.012	303.8	0.759	58.71	1.76	1.42	0.00	23.98	42.35	33.68	6.86	3.58
18	1550.3	1.016	329.8	0.824									
19	1560.2	1.023	339.6	0.849	54.69	1.83	1.21	0.01	20.09	40.03	39.87	7.11	3.51
20	1560.2	1.023	339.6	0.849									
21	1559.4	1.022	353.8	0.885	54.44	1.84	1.19	0.00	21.86	38.61	39.52	7.05	3.56
22	1555.0	1.020	346.5	0.866									
23	1550.3	1.016	369.7	0.924	55.56	1.82	1.25	0.00	25.20	41.09	33.70	6.74	3.61
24	1553.8	1.019	373.9	0.935									
25	1559.0	1.022	369.7	0.924	54.80	1.83	1.21	0.42	26.24	35.04	38.30	6.82	3.77
26	1559.0	1.022	369.7	0.924									
27	1560.6	1.023	361.5	0.904	55.27	1.83	1.24	0.38	32.16	35.43	32.03	6.48	3.72
28	1565.4	1.026	357.6	0.894									
29	1567.8	1.028	402.5	1.006	53.98	1.85	1.17						
30	1565.4	1.026	392.3	0.981									
31	1563.4	1.025	373.9	0.935	54.33	1.85	1.19						
32	1563.8	1.025	397.3	0.993									

Cruise: Planet Station: KWPL 244-2 date: 24 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1522.7	0.998	205.1	0.513	72.92	1.50	2.69	0.00	22.85	35.24	41.91	7.31	3.81
2	1528.1	1.002	232.6	0.582									
3	1532.3	1.005	246.1	0.615	66.05	1.62	1.95	0.00	22.60	37.54	39.85	7.10	3.66
4	1538.1	1.009	268.9	0.672									
5	1543.2	1.012	291.2	0.728	62.46	1.69	1.66	0.00	22.63	42.29	35.08	6.84	3.54
6	1546.7	1.014	309.2	0.773									
7	1548.3	1.015	314.8	0.787	60.40	1.73	1.53	0.05	25.42	38.92	35.62	6.73	3.68
8	1550.3	1.016	326.6	0.817									
9	1547.5	1.015	309.2	0.773	59.03	1.75	1.44	0.08	30.74	37.69	31.49	6.73	3.98
10	1551.0	1.017	317.6	0.794									
11	1553.8	1.019	323.6	0.809	57.53	1.78	1.35	0.12	23.24	40.43	36.21	6.90	3.62
12	1552.6	1.018	323.6	0.809									
13	1551.4	1.017	333.0	0.832	59.64	1.74	1.48	0.24	28.27	34.57	36.92	6.73	3.78
14	1551.8	1.018	361.5	0.904									
15	1553.0	1.018	353.8	0.885	57.81	1.78	1.37	0.32	28.43	33.62	37.63	6.80	3.90
16	1553.0	1.018	357.6	0.894									
17	1551.8	1.018	365.5	0.914	56.98	1.79	1.32	0.33	29.19	37.31	33.18	6.46	3.65
18	1553.4	1.019	365.5	0.914									
19	1552.2	1.018	382.8	0.957	57.70	1.78	1.36	0.21	27.17	34.71	37.91	6.87	3.82
20	1547.9	1.015	378.3	0.946									
21	1547.1	1.014	365.5	0.914	57.09	1.79	1.33	0.67	27.60	34.14	37.60	6.62	3.82
22	1548.3	1.015	378.3	0.946									
23	1551.8	1.018	369.7	0.924	56.42	1.80	1.29	0.93	29.73	31.59	37.75	6.58	4.06
24	1553.4	1.019	382.8	0.957									
25	1551.8	1.018	378.3	0.946	56.97	1.79	1.32	0.95	38.15	30.47	30.43	6.31	4.16
26	1551.8	1.018	361.5	0.904									
27	1553.0	1.018	369.7	0.924	46.30	1.98	0.86	0.38	27.52	34.61	37.49	6.64	3.84
28	1551.4	1.017	373.9	0.935									
29	1547.9	1.015	365.5	0.914	56.97	1.80	1.32	0.86	37.57	28.41	33.17	6.36	4.17
30	1553.8	1.019	392.3	0.981									

Cruise: Planet Station:KWPL 263 date: 25 Feb 95
lat: 24-35.97 N long: 82-49.00 W depth: 24 m

calc for: 21.0 deg C 36.0 o/oo 24.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	Vp (m/s)	Vp Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1651.0	1.083	287.9	0.720	45.81	1.99	0.85	0.90	91.11	5.26	2.73	1.00	1.33
2	1659.1	1.088	314.8	0.787									
3	1668.2	1.094	306.2	0.765	44.89	2.00	0.81	0.90	94.03	1.72	3.35	1.05	0.98
4	1674.6	1.098	261.1	0.653									
5	1679.3	1.101	265.2	0.663	44.65	2.01	0.81	0.66	93.90	3.39	2.05	1.10	1.06
6	1680.2	1.102	271.7	0.679									
7	1679.3	1.101	263.2	0.658	45.55	2.00	0.84	0.80	91.18	3.90	4.13	1.35	1.51
8	1677.4	1.100	283.1	0.708									
9	1675.6	1.099	303.4	0.759	44.67	2.01	0.81	1.07	91.55	3.29	4.09	1.15	1.49
10	1674.6	1.098	344.4	0.861									
11	1669.1	1.094	413.5	1.034	46.47	1.99	0.87	2.10	89.89	3.48	4.54	1.08	1.62
12	1669.1	1.094	512.2	1.281									

3.1.3 Bottom Roughness Analysis

Table 3.1.3 below shows the number of paired stereo photographs taken at each experimental site. Representative photographs were selected for digitizing and subsequent analysis based on clarity of representative features and azimuthal direction (orientation is necessarily chosen according to the azimuthal orientation of acoustic tracks).

Table 3.1.3.1

Location	No. of Stereo Pairs	Digitized Pairs
Boca Raton	148	27
Indian Rocks Beach	68	20
Lower Tampa Bay	0	0
Key West	88	18
Total	304	65

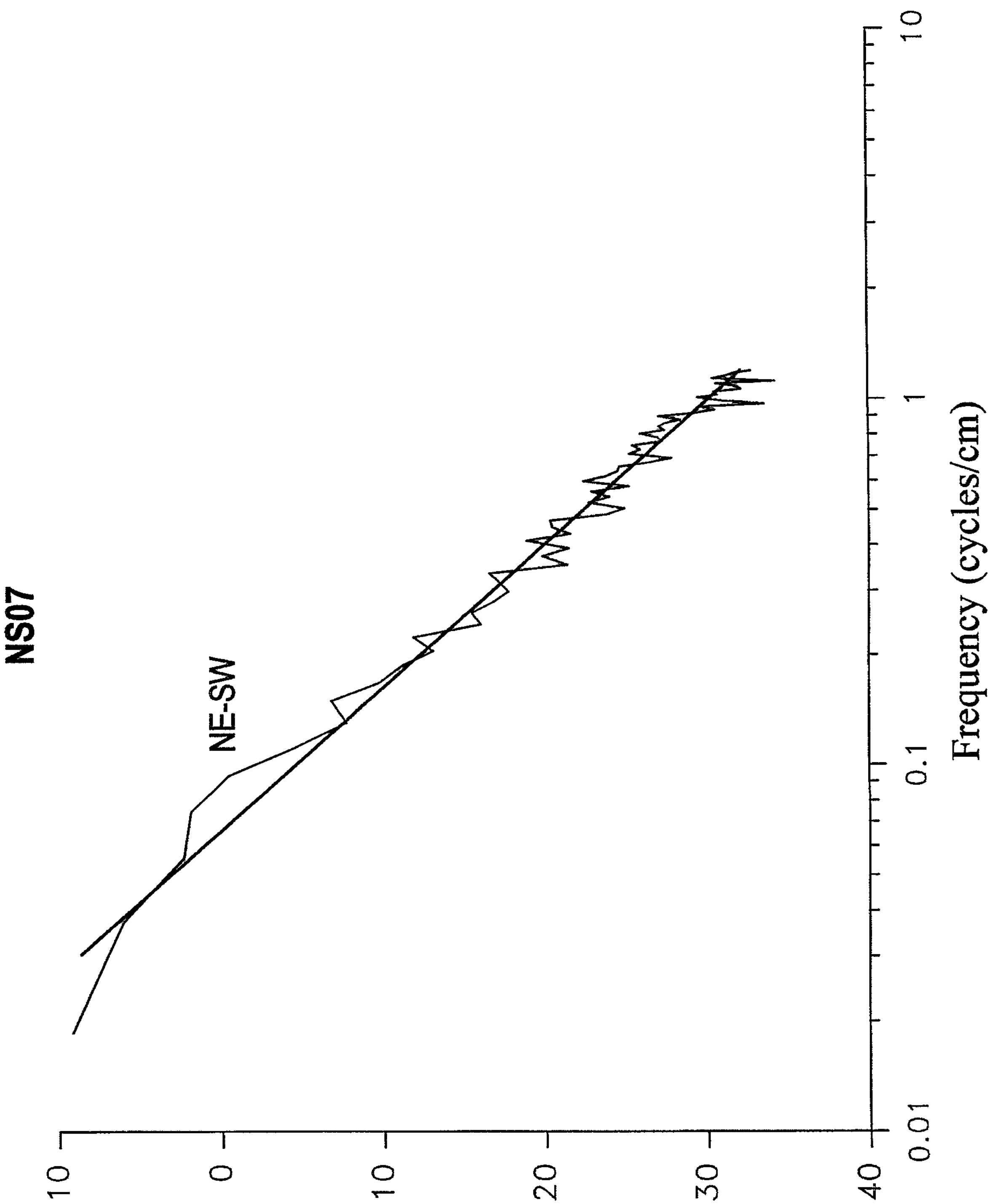
Sections 3.1.3.1, 3.1.3.2, and 3.1.3.3 display the roughness power spectra estimated from the digitized height profiles from each stereo pair and averaged over all spectra with the same orientation for Boca Raton, the Dry Tortugas, and Indian Rocks Beach respectively. A regression line is plotted for each spectrum and the slope and intercept of the regression is given in the Table 3.1.3.2.

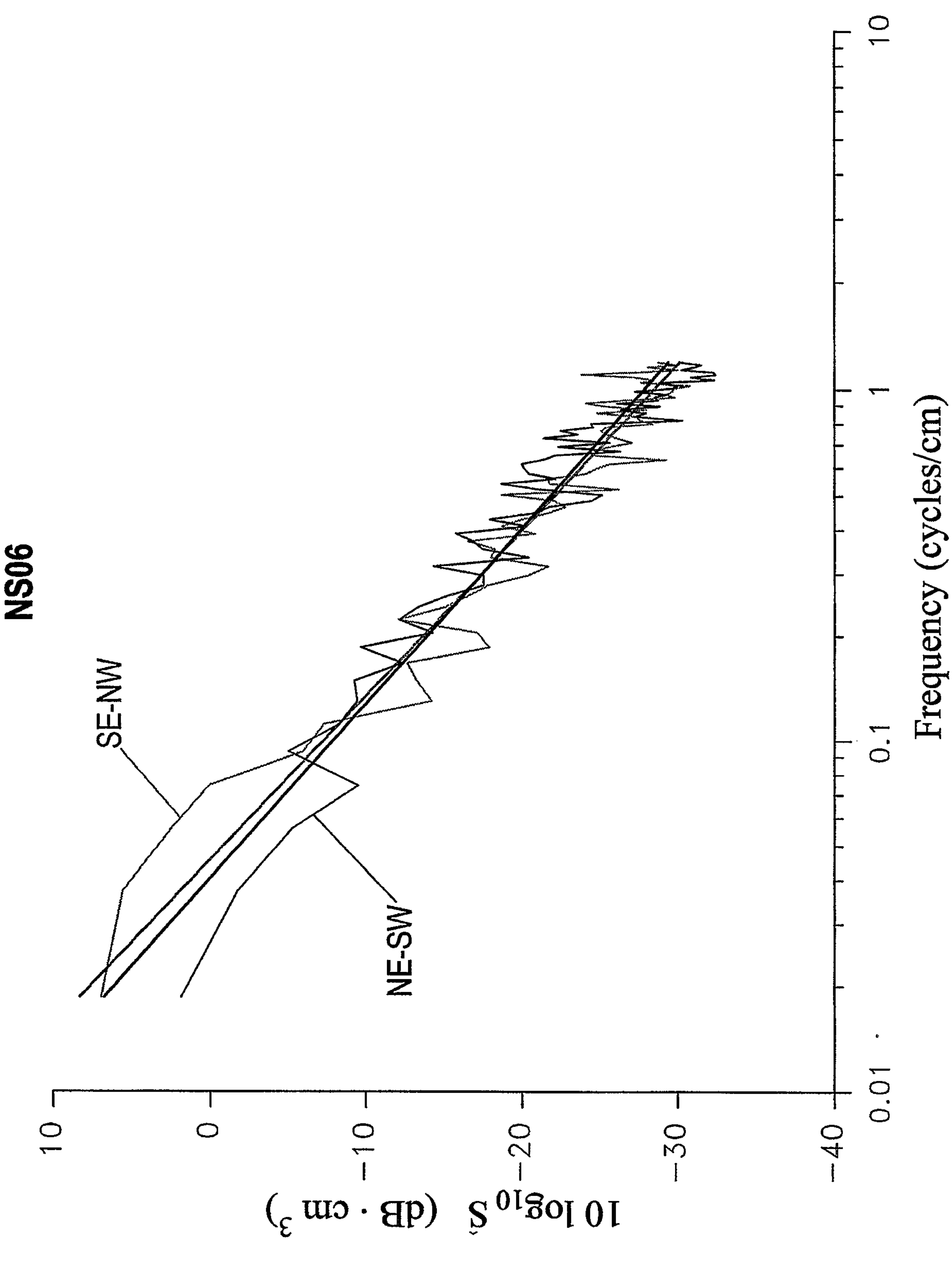
Table 3.1.3.2

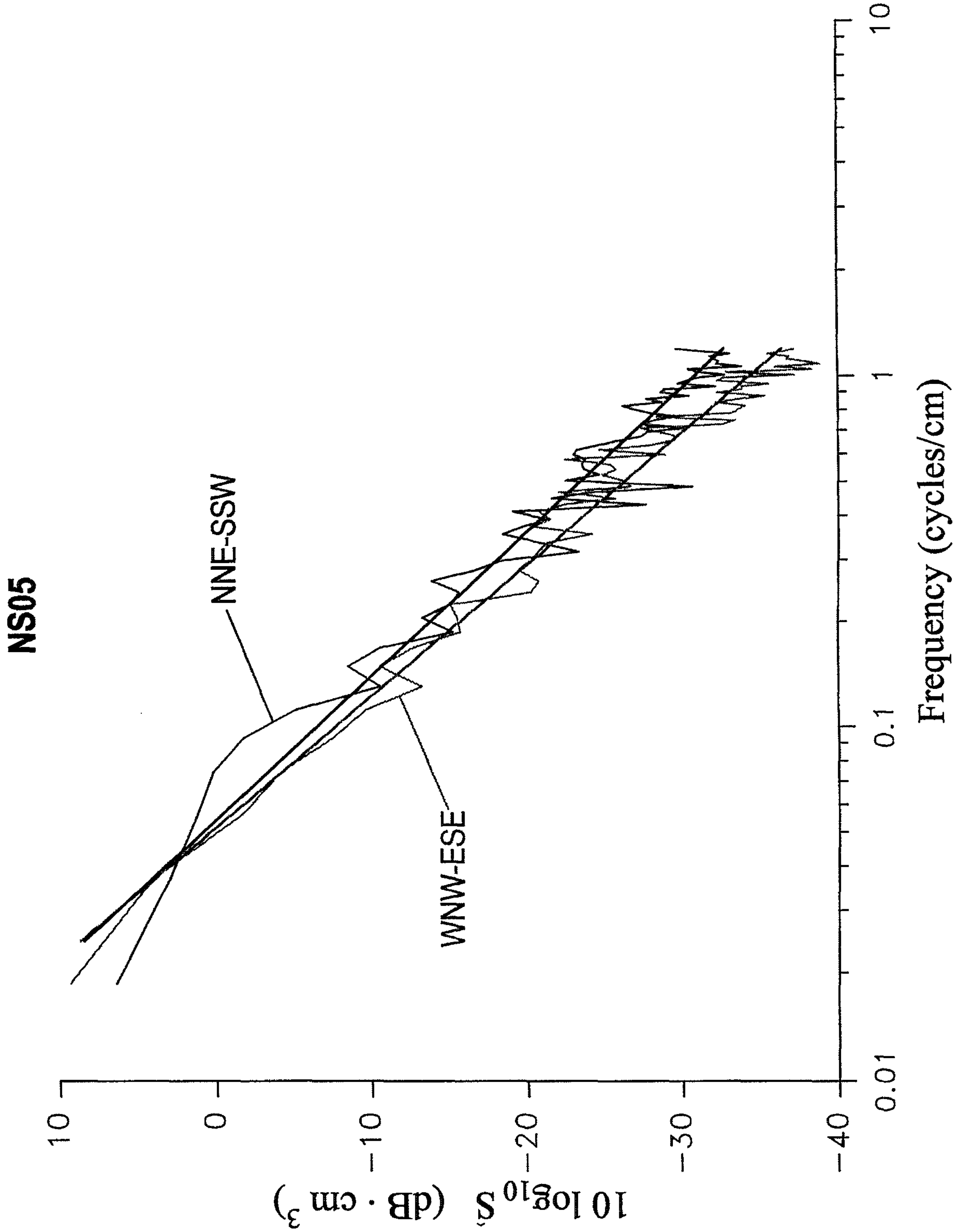
Location (Orientation)	Slope	Intercept ($x10^{-4}$)
NS01 (NNE-SSW)	-2.21	21.08
NS02 (NNE-SSW)	-2.39	11.19
NS03 (NNE-SSW)	-2.86	5.19
NS03 (ESE-WNW)	-2.70	9.53
NS05 (NNE-SSW)	-2.44	8.18
NS05 (WNW-ESE)	-2.67	3.63
NS06 (NE-SW)	-2.00	16.42
NS06 (SE-NW)	-2.67	3.63
NS07 (NE-SW)	-2.56	9.52
IRB6 (S-N)	-2.35	4.26
IRB6 (W-E)	-2.34	11.30
IRB7 (S-N)	-2.26	11.63
IRB7 (W-E)	-2.59	8.30
KW (undisturbed)	-2.29	20.92
KW (gouged)	-2.8	13.59
KW (smoothed)	-2.6	7.25

3.1.3.1 Bottom Roughness Analysis: Boca Raton

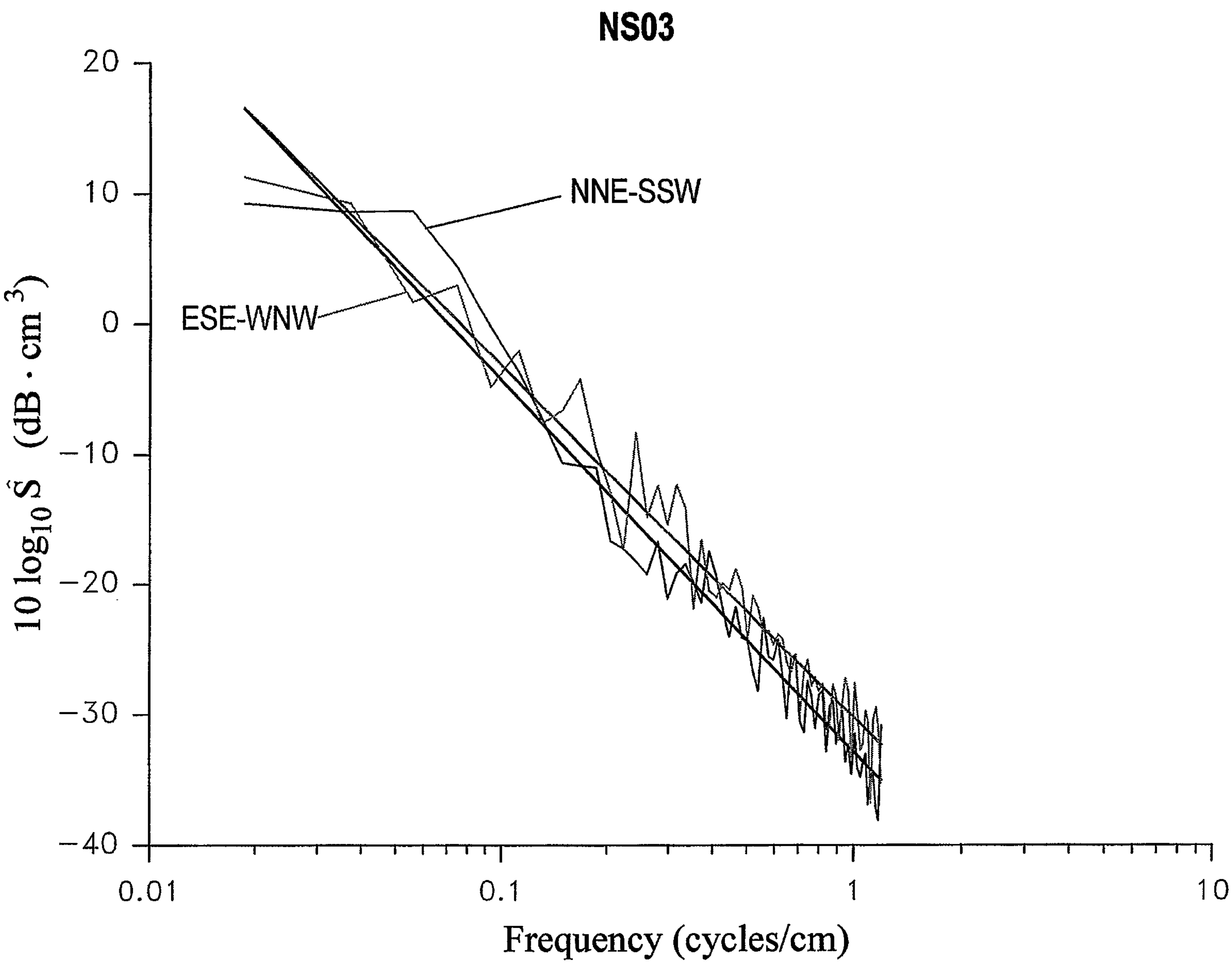
Roughness power spectra estimated at the following stations: NS01
NS02
NS03
NS05
NS06
NS07

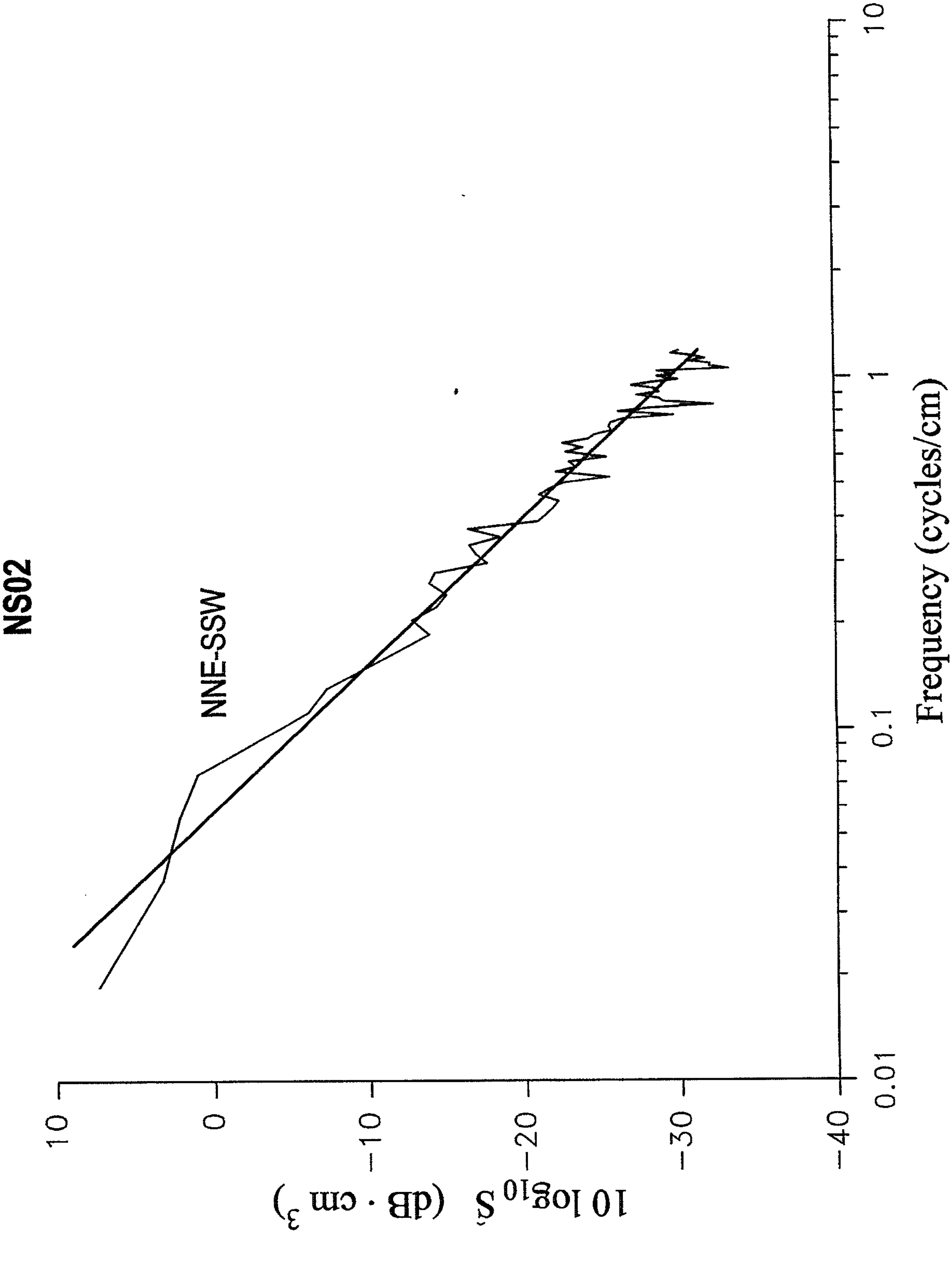

NS07
NE-SW
10
0
−10
−20
−30
−40
0.01
0.1
1
10
Frequency (cycles/cm)
10 log$_{10}$ Ŝ (dB · cm^3)

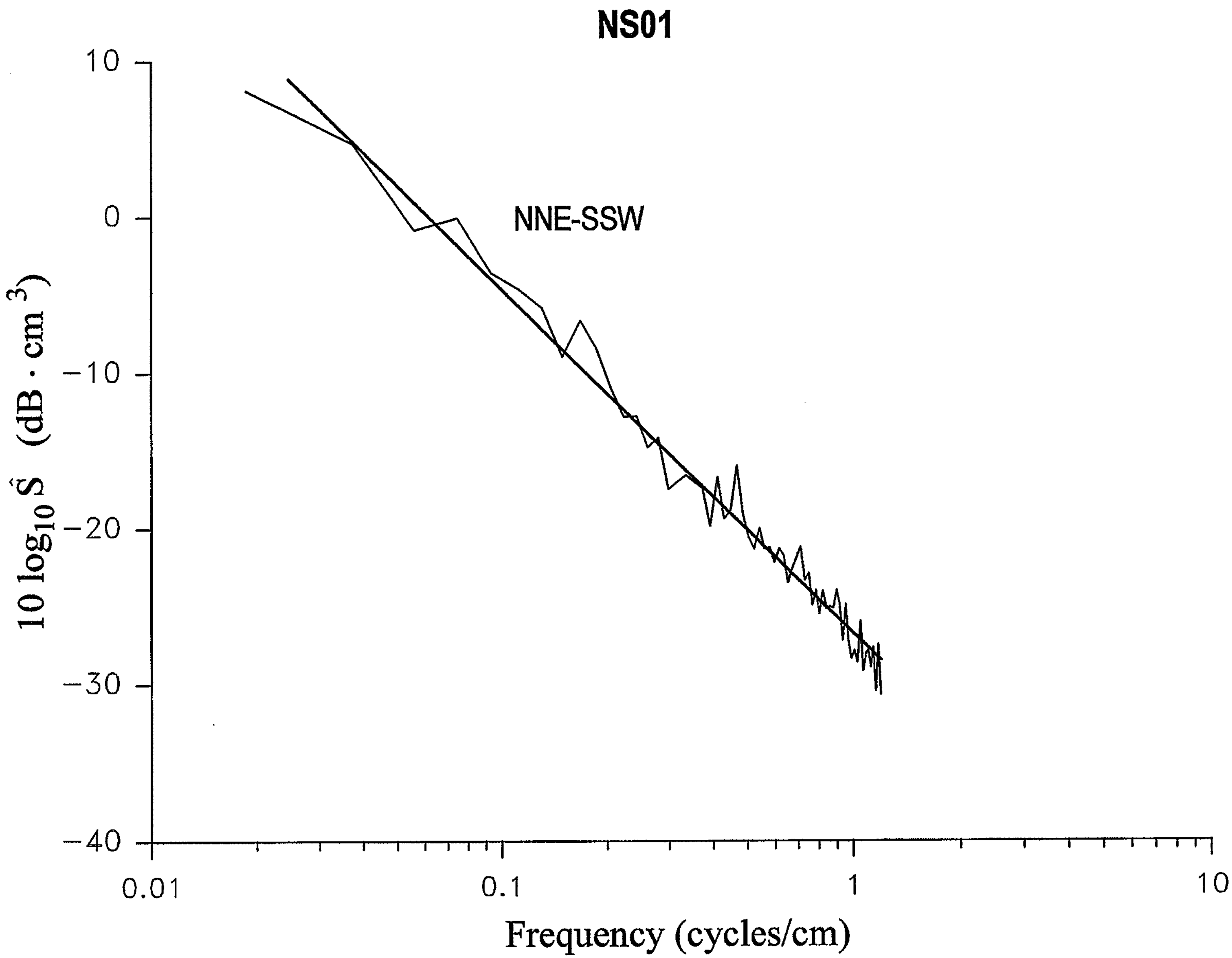

NS06
SE-NW
NE-SW
10 log10 S (dB · cm 3)
Frequency (cycles/cm)
10
0
−10
−20
−30
−40
0.01
0.1
1
10



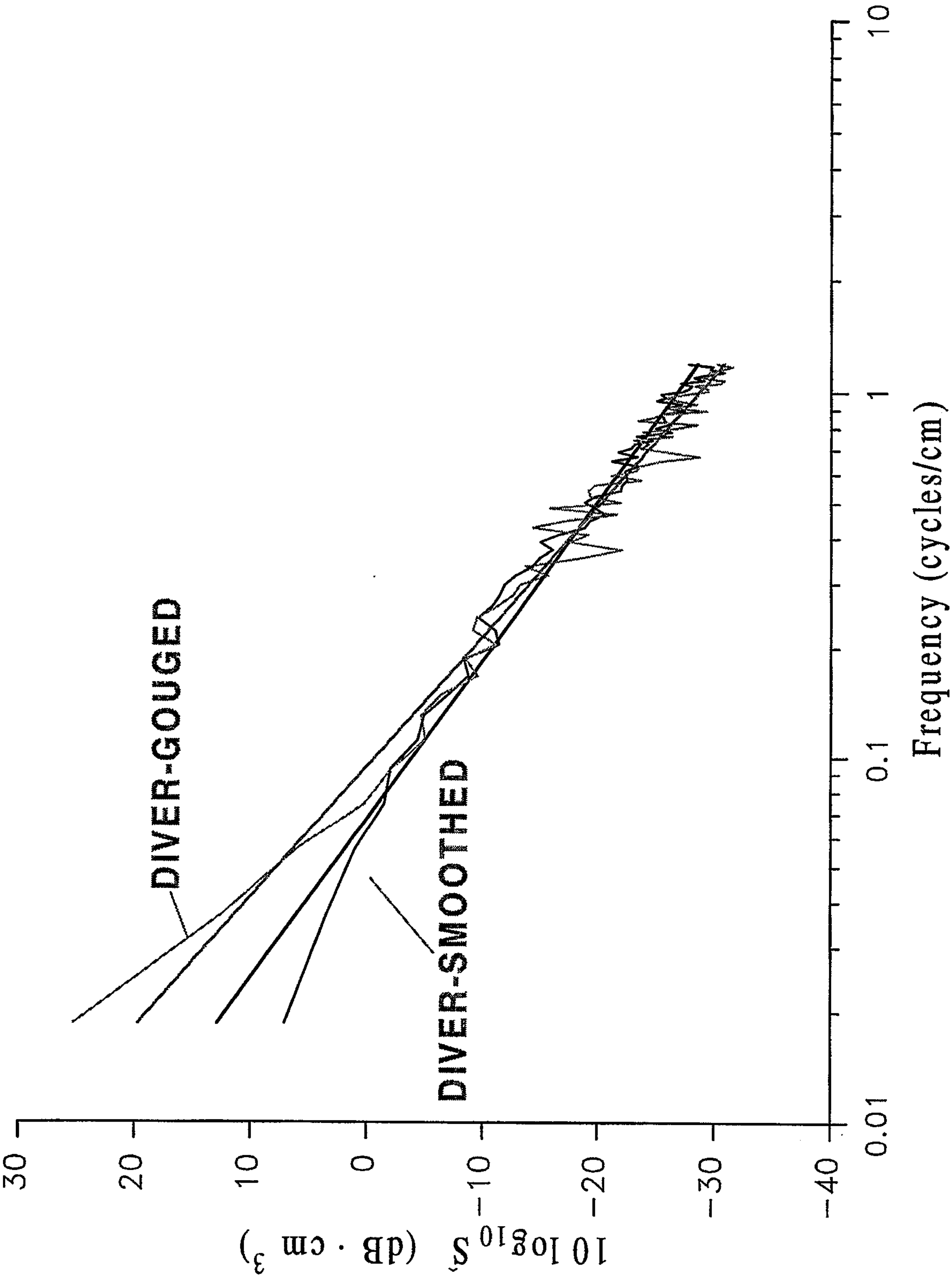
NS05
NNE-SSW
WNW-ESE
10
0
−10
−20
−30
−40
0.01
0.1
1
10
Frequency (cycles/cm)
10 log10 Ŝ (dB · cm 3)


NS03
NNE-SSW
ESE-WNW
20
10
0
−10
−20
−30
−40
10 log10 Ŝ (dB · cm 3)
0.01
0.1
1
10
Frequency (cycles/cm)


NS02
NNE-SSW
10 log10 S (dB · cm 3)
10
0
−10
−20
−30
−40
0.01
0.1
1
10
Frequency (cycles/cm)


NS01
NNE-SSW
10 log10 Ŝ (dB · cm 3)
10
0
−10
−20
−30
−40
0.01
0.1
1
10
Frequency (cycles/cm)

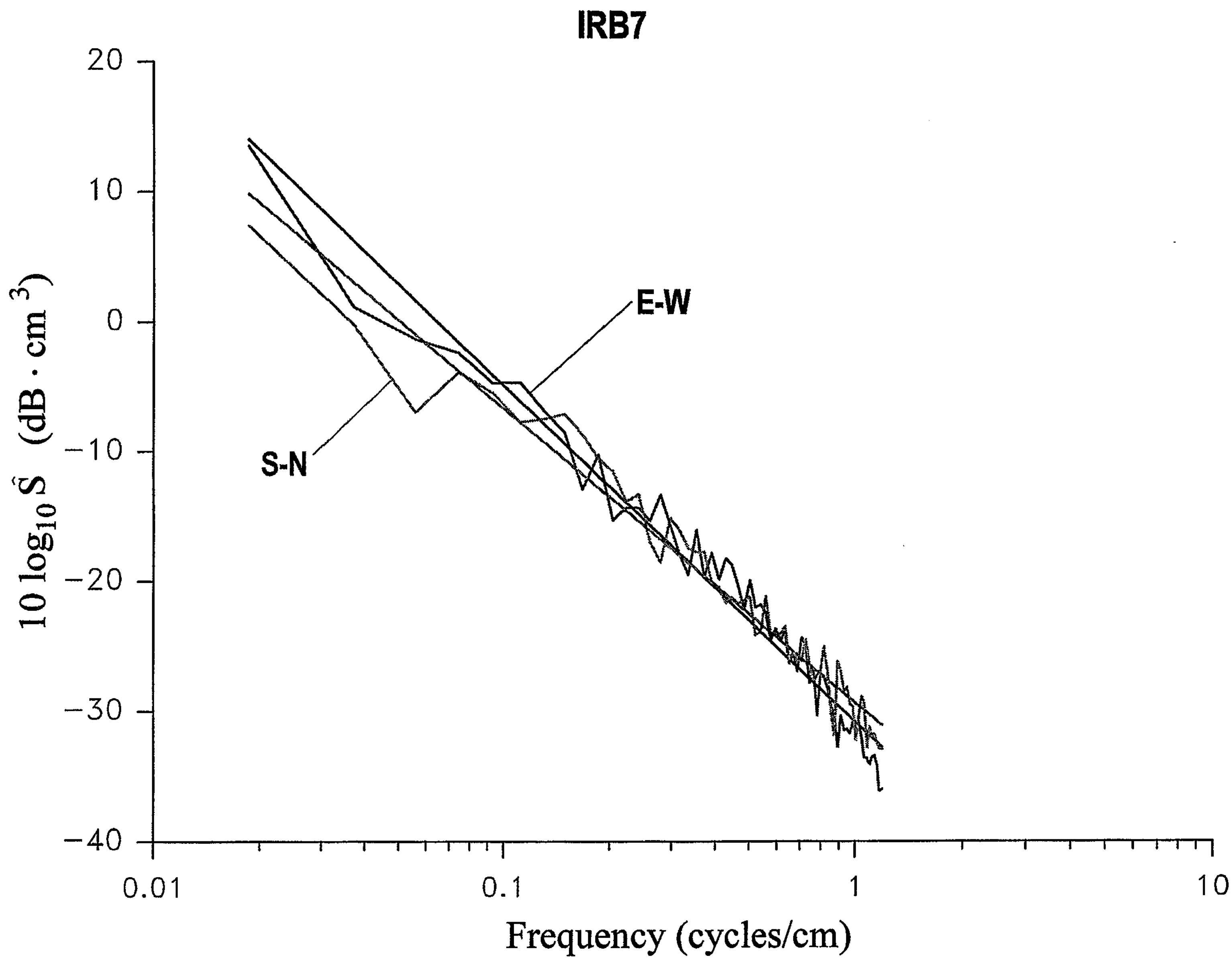
3.1.3.2 Bottom Roughness Analysis: Dry Tortugas

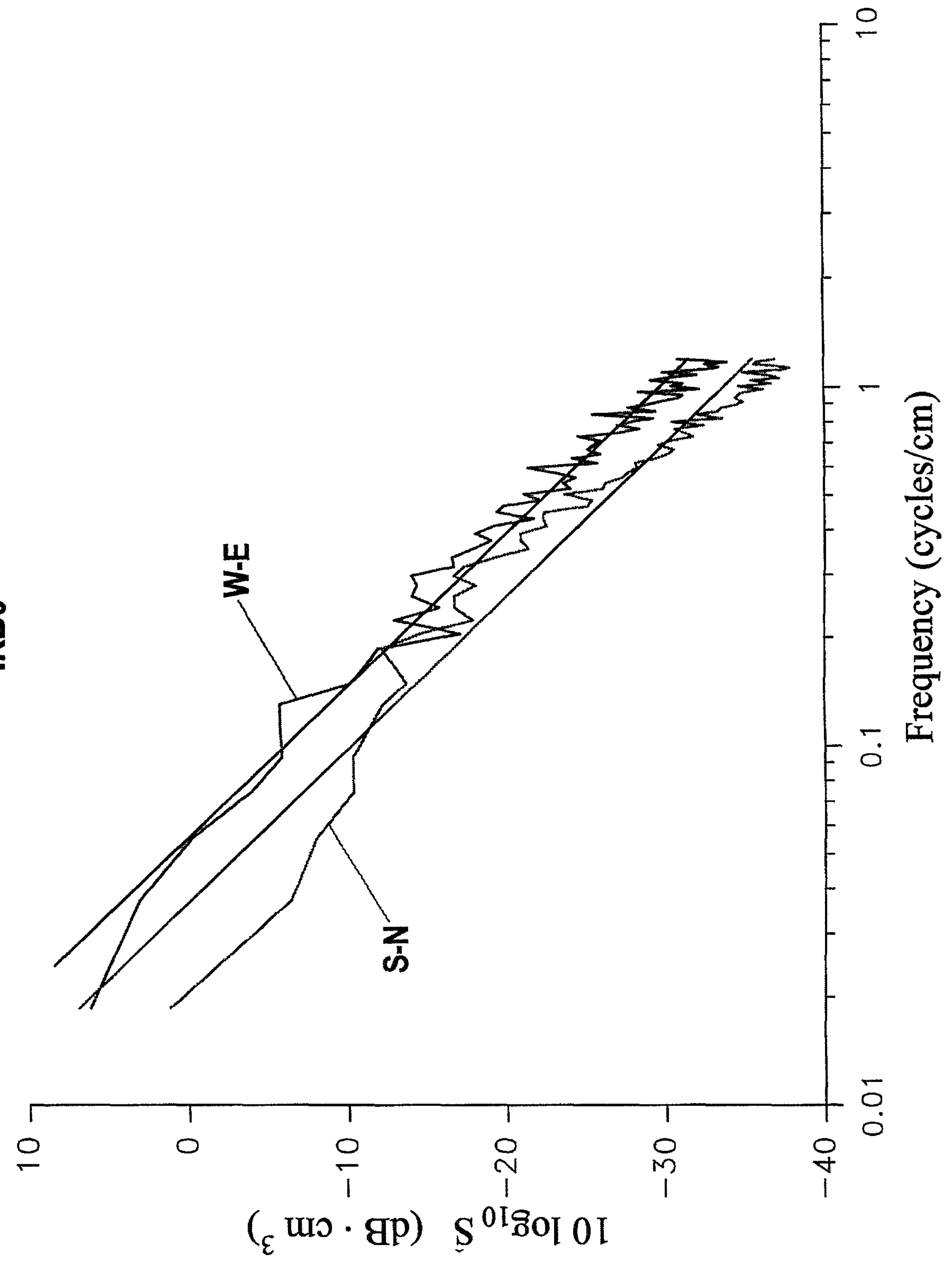


DIVER-GOUGED
DIVER-SMOOTHED
30
20
10
0
−10
−20
−30
−40
0.01
0.1
1
10
Frequency (cycles/cm)

3.1.3.3 Bottom Roughness Analysis: Indian Rocks Beach

Roughness power spectra estimated at the following stations: IRB6
IRB7


IRB7
E-W
S-N
20
10
0
−10
−20
−30
−40
10 log₁₀ Ŝ (dB · cm 3)
0.01
0.1
1
10
Frequency (cycles/cm)


IRB6
W-E
S-N
10 log₁₀ S (dB · cm³)
Frequency (cycles/cm)
10
0
−10
−20
−30
−40
0.01
0.1
1
10

3.1.4 In Situ Shear Strength

Figure 3.1.4.1 illustrates in situ shear strength measured at the Dry Tortugas test site.

Results of in situ shear strength are shown in tabular form for the following locations:

KW-PL-118-1
KW-PL-118-2
KW-PL-188-3
KW-PL-188-4
KW-PL-118-5
KW-PL-118-6
KW-PL-123-1
KW-PL-123-2
KW-PL-123-3
KW-PL-123-4
KW-PL-135-1
KW-PL-135-2
KW-PL-135-3
KW-PL-135-4
KW-PL-135-5
KW-PL-150-1
KW-PL-150-2
KW-PL-150-3

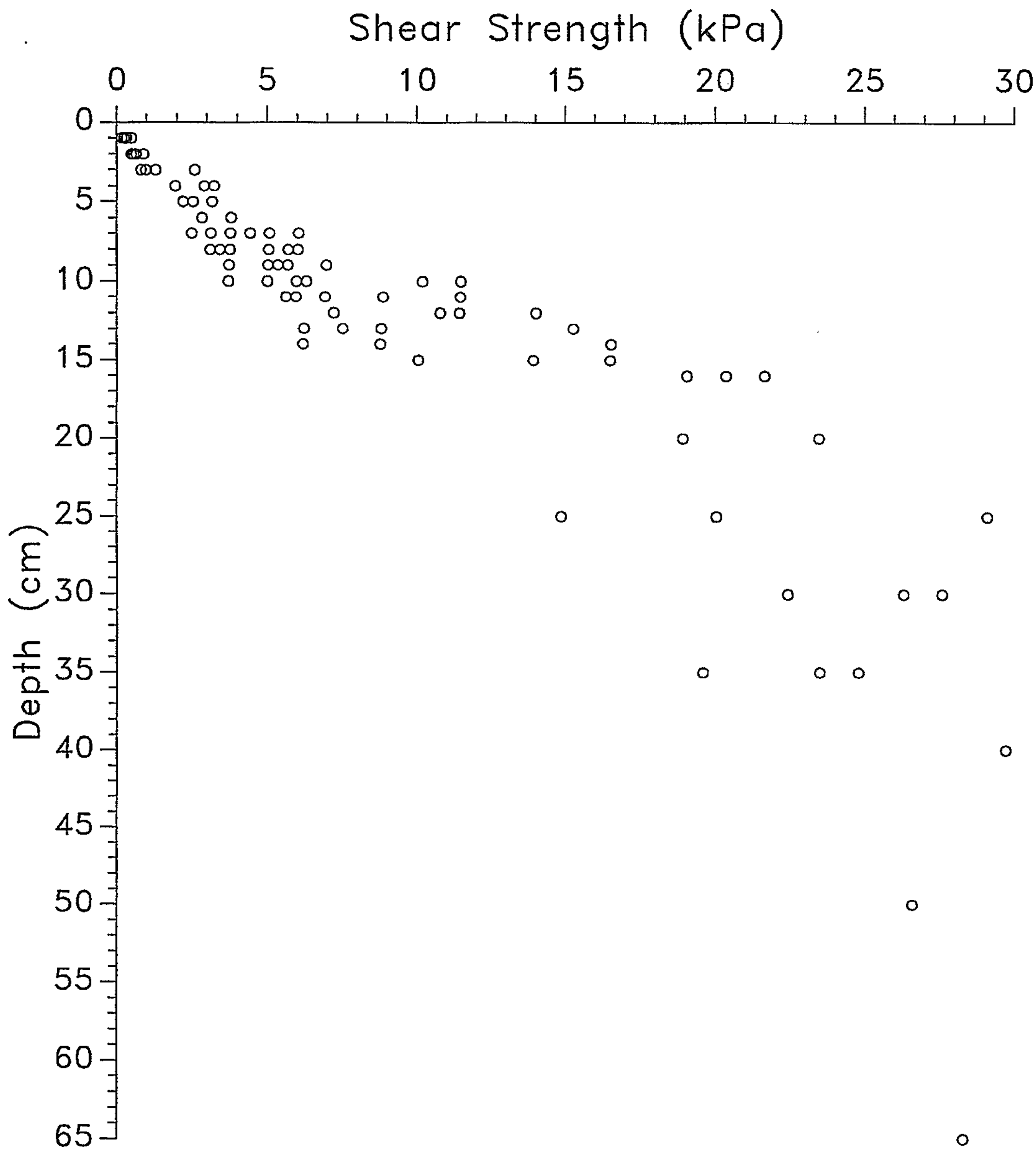


Figure 3.1.4.1 In-situ shear strength at the Dry Tortugas test site.

KWPL118-1
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.04	2.47	0.24
2	0.07	4.95	0.49
3	0.12	8.25	0.81

KWPL118-2
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width= 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.02	1.65	0.16
2	0.13	9.07	0.89

KWPL118-3
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.07	4.95	0.49
2	0.08	5.77	0.57

KWPL118-4
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.07	4.95	0.49

KWPL118-5
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.05	3.3	0.32
2	0.09	6.6	0.65

KWPL118-6
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
1	0.05	3.30	0.32
2	0.09	6.60	0.65
3	0.12	8.25	0.81

KWPL123-1

14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR

Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
3	0.14	9.90	0.97
4	0.28	19.79	1.94
5	0.32	22.46	2.20
6	0.41	28.87	2.83

KWPL123-2

14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR

Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
3	0.14	9.90	0.97
4	0.28	19.79	1.94
5	0.37	25.76	2.53
6	0.41	28.87	2.83
7	0.36	25.36	2.49
8	0.45	31.73	3.11
9	0.54	38.08	3.73

KWPL123-3

14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR

Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Strength (lb/in2)	Strength (g/cm2)	Strength (kPa)
3	0.38	26.39	2.59
4	0.42	29.69	2.91
6	0.55	38.76	3.80
7	0.55	38.55	3.78
10	0.54	37.83	3.71

KWPL123-4

14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR

Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
3	0.19	13.19	1.29
4	0.47	32.98	3.23
5	0.46	32.36	3.17
7	0.55	38.55	3.78
8	0.55	38.32	3.76

KWPL135-1
15 Feb 95 24-36.81 N 82-50.91 W 25 m
DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
7	0.64	45.15	4.43
8	0.83	58.11	5.70
9	0.54	38.08	3.73

KWPL135-2
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
7	0.88	61.64	6.04
8	0.73	51.52	5.05
9	1.01	71.07	6.97

KWPL135-3
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
7	0.64	45.15	4.43
8	0.83	58.11	5.70
9	0.78	54.58	5.35
10	0.87	60.92	5.97
11	1.00	70.55	6.92
12	1.05	73.57	7.21
13	1.09	76.57	7.51

KWPL135-4
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
7	0.74	51.74	5.07
8	0.87	61.41	6.02
9	0.82	57.87	5.68

KWPL135-5
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
7	0.45	31.95	3.13
8	0.50	35.03	3.43
9	0.73	51.28	5.03
10	0.91	64.22	6.30
11	0.86	60.65	5.95
14	0.90	63.08	6.19

KWPL150-1
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
10	0.73	51.02	5.00
11	0.82	57.35	5.62
12	1.56	109.85	10.77
13	0.90	63.38	6.22
14	1.27	89.47	8.77
15	2.39	168.31	16.51
16	2.76	194.38	19.06
20	3.40	239.17	23.45
25	4.22	296.60	29.09
30	3.25	228.50	22.41
35	2.84	199.79	19.59
40	4.31	302.86	29.70
50	3.86	271.04	26.58

KWPL150-2
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
10	1.66	116.99	11.47
11	1.66	116.72	11.45
12	2.03	142.83	14.01
13	1.28	89.77	8.80
14	2.40	168.63	16.54
15	1.46	102.35	10.04
16	2.95	207.57	20.36
20	2.75	192.99	18.93
25	2.15	151.47	14.85
30	3.81	268.08	26.29
35	3.59	252.57	24.77

KWPL150-3
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in2)	Shear Strength (g/cm2)	Shear Strength (kPa)
10	1.48	103.80	10.18
11	1.28	90.34	8.86
12	1.66	116.45	11.42
13	2.22	155.74	15.27
14	2.40	168.63	16.54
15	2.02	141.93	13.92
16	3.14	220.77	21.65
20	2.75	192.99	18.93
25	2.91	204.25	20.03
30	4.00	281.27	27.58
35	3.40	239.38	23.47
65	4.10	288.25	28.27

3.2 Physical Properties Measurements (Stephens and Lavoie)

Depth profiles of the physical properties are shown for Boca Raton (Figure 3.2.1 a, b, and c), the Dry Tortugas (Figure 3.2.2) Lower Tampa Bay (Figure 3.2.3 a and b), and Indian Rocks Beach (Figure 3.2.4 a, b, and c). A summary of the physical properties data is given in tabular form (Table 3.2.1).

Section 3.2.1 is a complete listing of the physical and geoacoustic properties data from sampled cores is given in tabular form for Boca Raton, 3.2.1.1, the Dry Tortugas, 3.2.1.2, the Marquesas Keys, 3.2.1.3, Lower Tampa Bay, 3.2.1.4, and Indian Rocks Beach, 3.2.1.5.

Core logger data, compressional wave velocity and wet bulk density, from cores which were not sampled, are illustrated in section 3.2.2. The section is subdivided into the Dry Tortugas, 3.2.2.1, and the Marquesas Keys, 3.2.2.2.

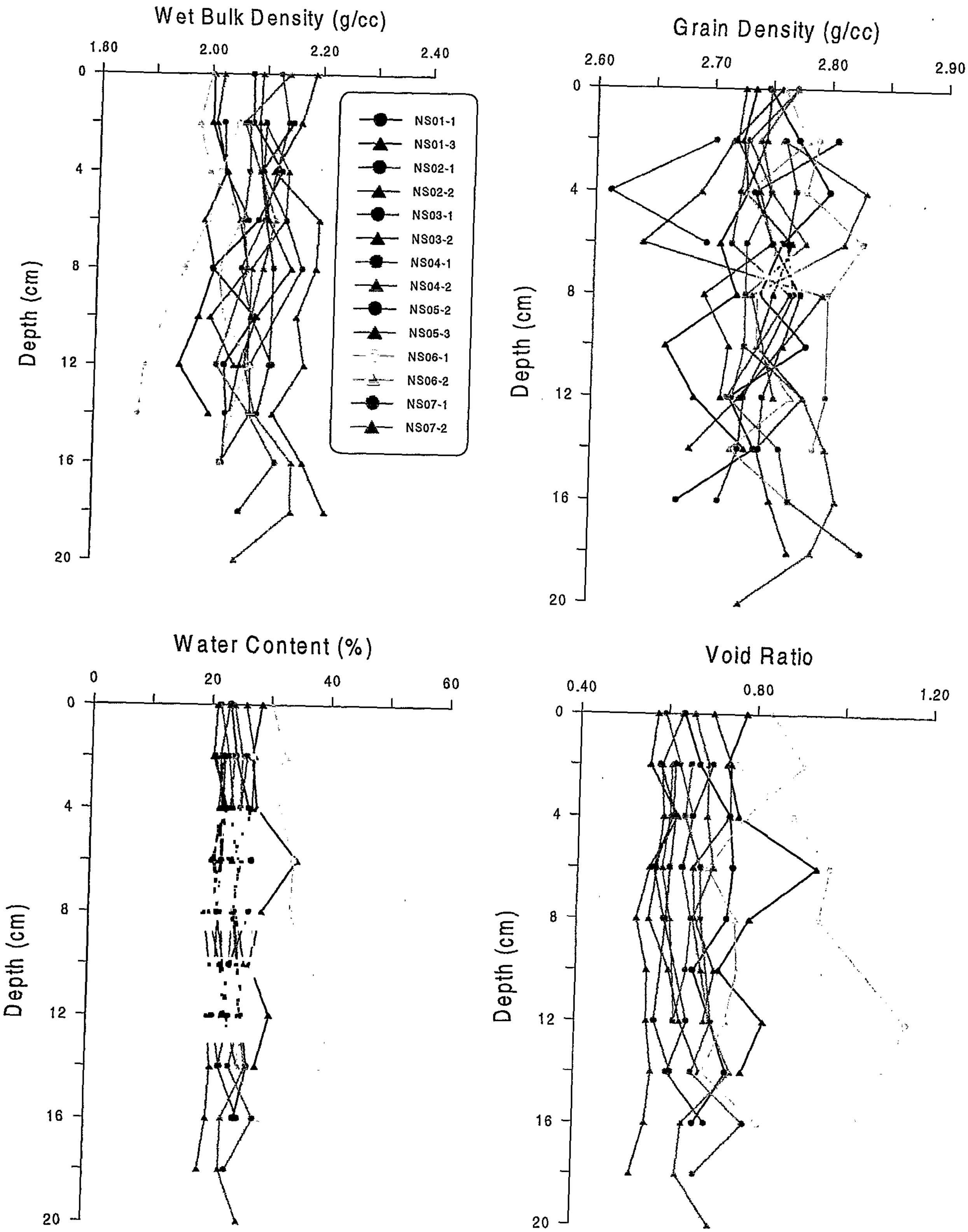


Figure 3.2.1 (a) Boca Raton Physical Properties

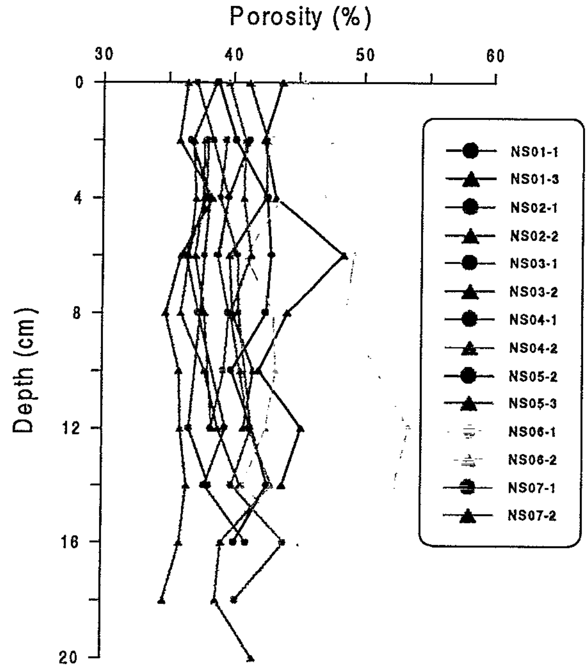


Figure 3.2.1 (b) Boca Raton Physical Properties Data

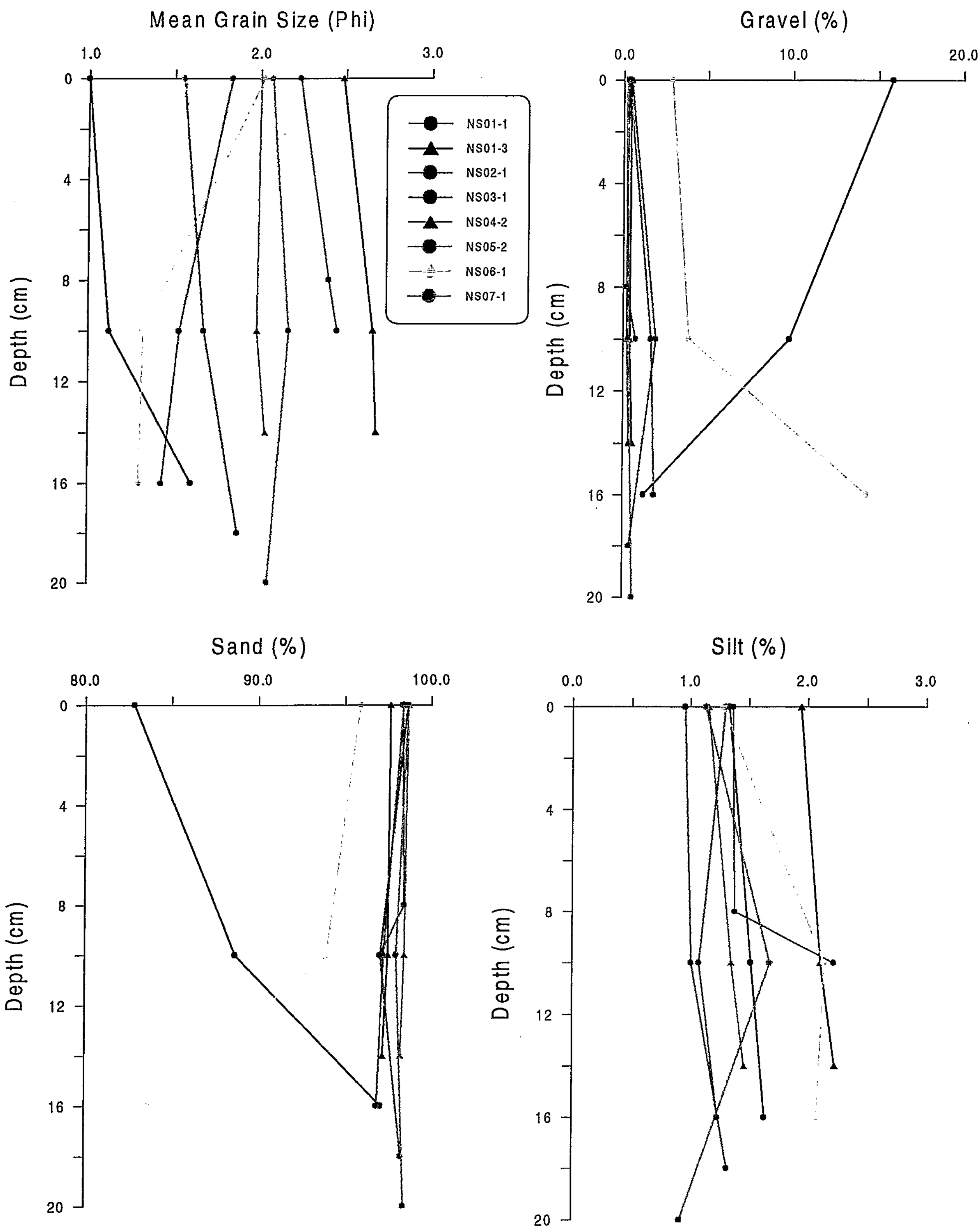


Figure 3.2.1 (c) Boca Raton Grain Size Data

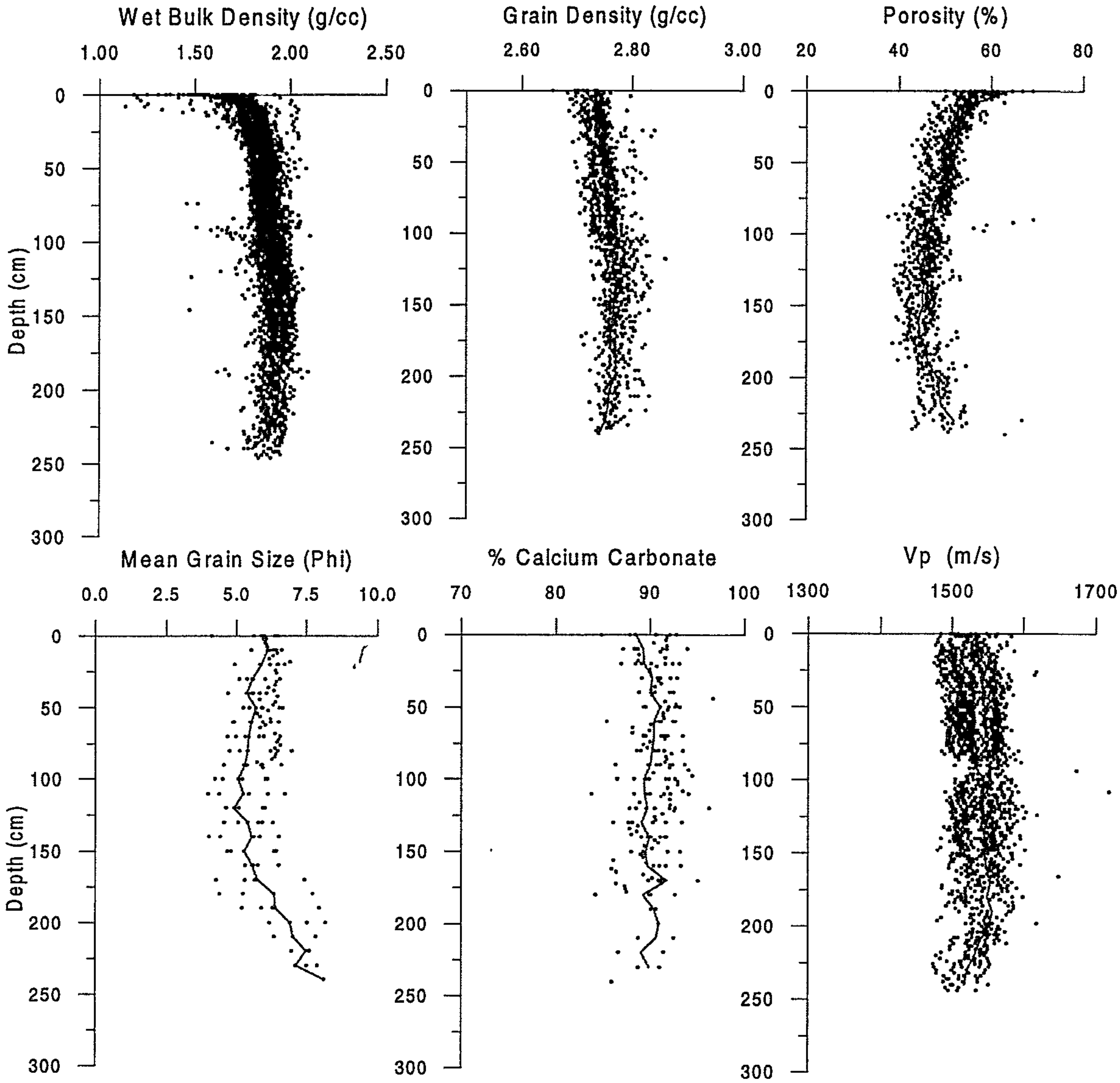


Figure 3.2.2 Dry Tortugas Physical and Geoacoustic Properties

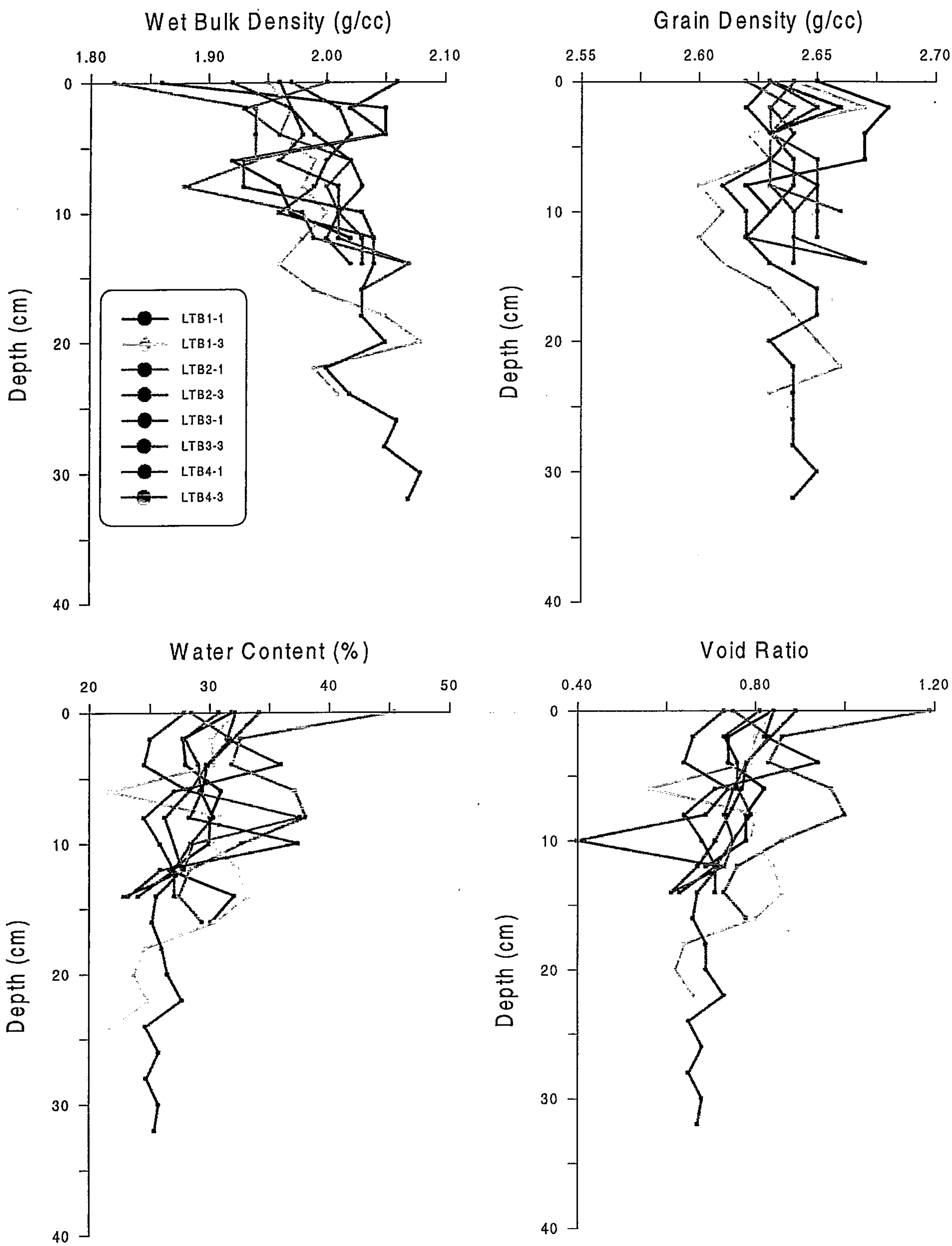


Figure 3.2.3 (a) Lower Tampa Bay Physical Properties Data

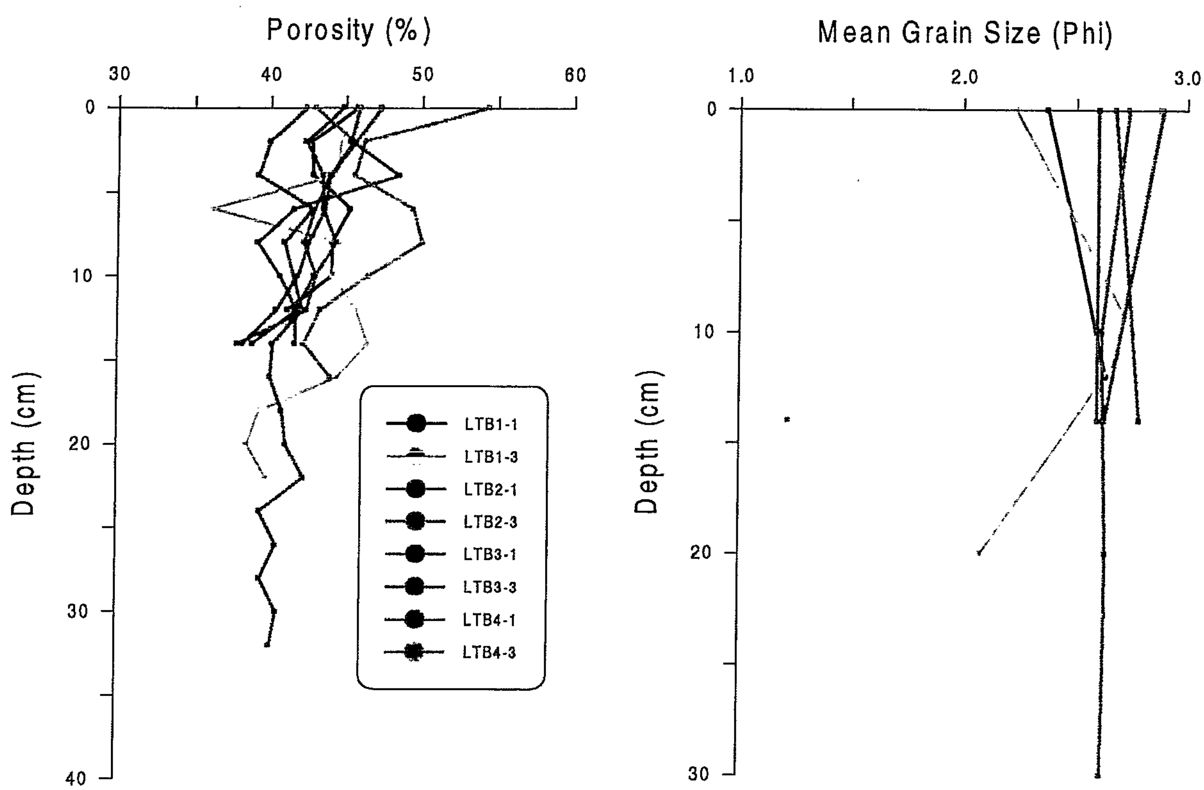


Figure 3.2.3 (b) Lower Tampa Bay Physical Properties and Grain Size Data

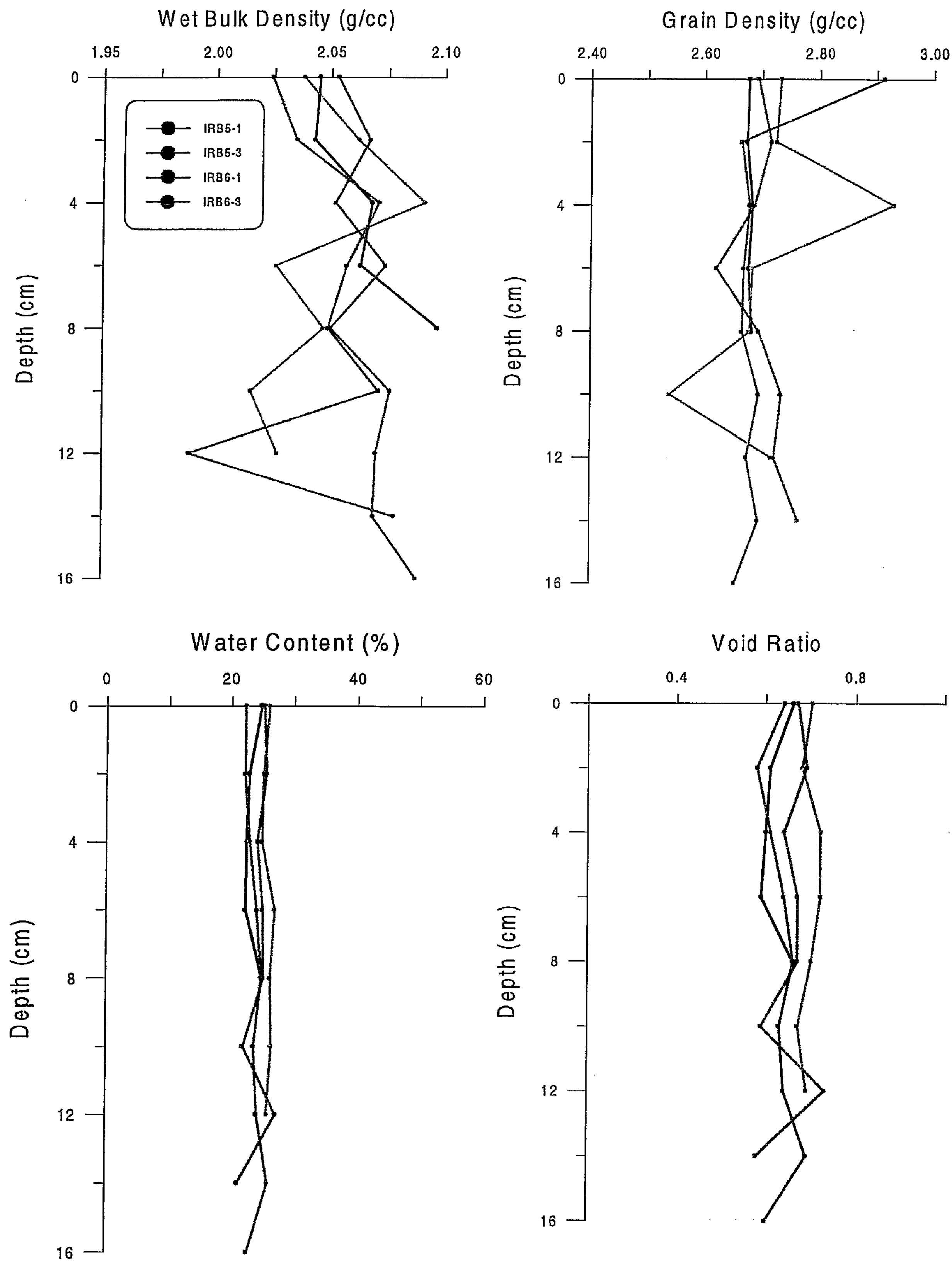


Figure 3.2.4 (a) Indian Rocks Beach Physical Properties Data

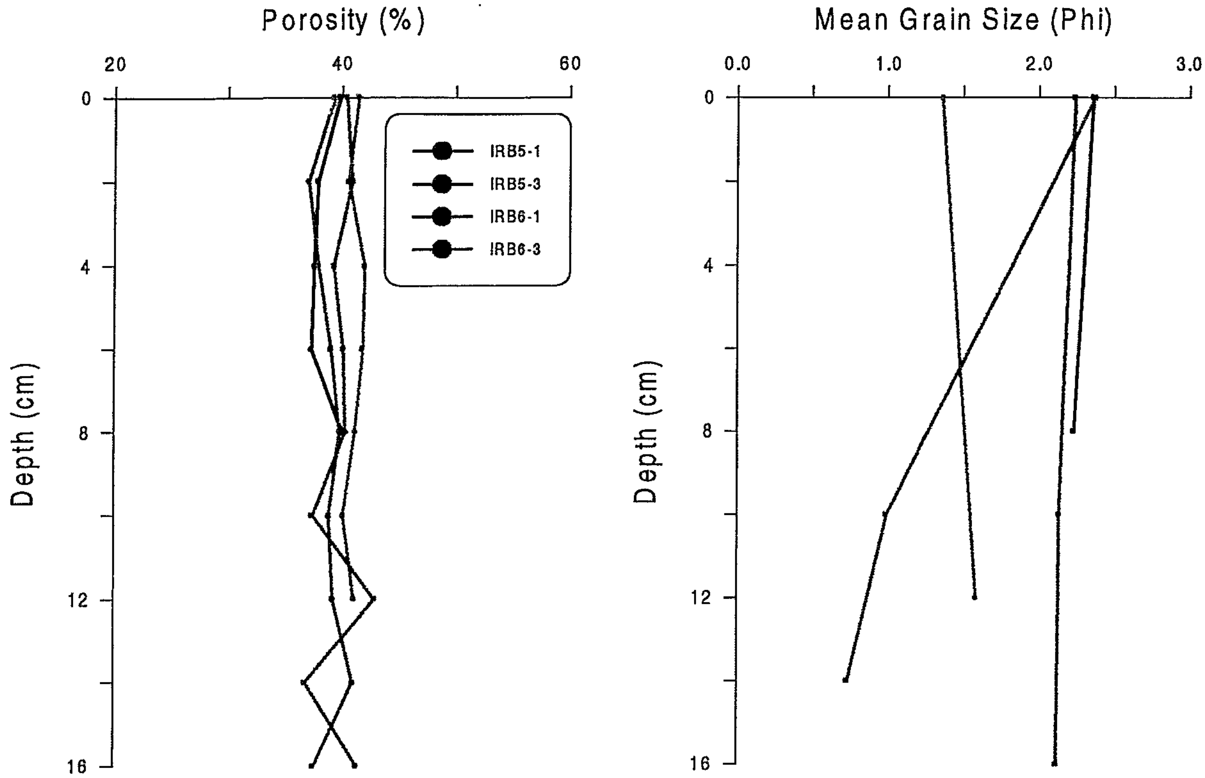


Figure 3.2.4 (b) Indian Rocks Beach Physical Properties and Grain Size Data.

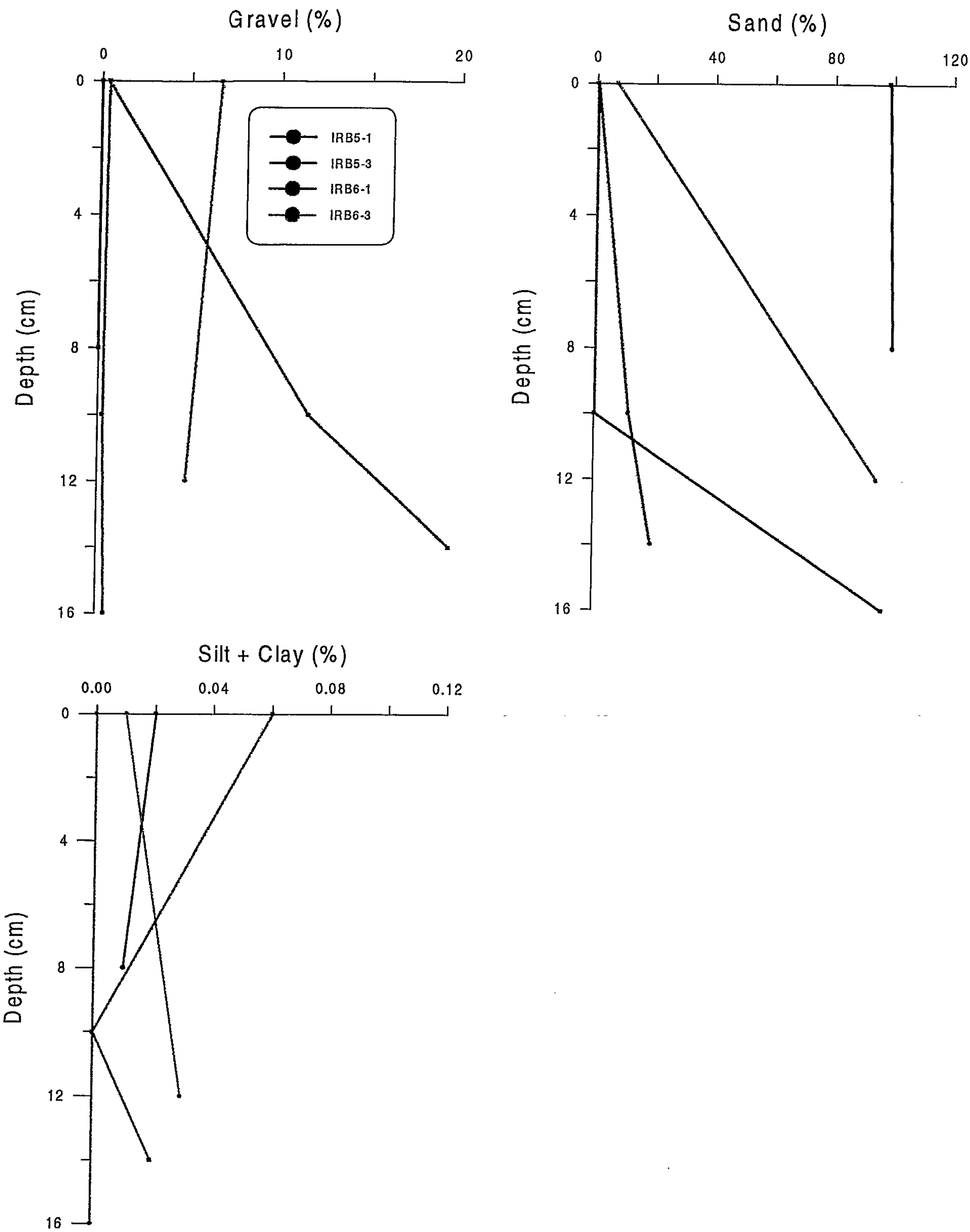


Figure 3.2.4 (c) Indian Rocks Beach Grain Size Data

Table 3.2.1 Summary of physical and geoacoustic properties.

Boca Raton	**Mean**	**Stdev**	**Max**	**Min**	**Number**
Wet Bulk Density (g/cm^3)	2.09	0.08	2.25	1.88	144
Grain Density (g/cm^3)	2.74	0.04	2.83	2.61	144
Water Content (%)	24.03	4.55	41.1	15.5	144
Void Ratio	0.66	0.13	1.15	0.42	144
Porosity (%)	39.37	4.40	53.5	29.7	144
Mean Grain Size (Phi)	1.9	0.47	1.0	2.7	24
Vp (lab)	1720		1783	1643	486

Indian Rocks Beach	**Mean**	**Stdev**	**Max**	**Min**	**Number**
Wet Bulk Density (g/cm^3)	2.05	0.02	2.1	1.99	29
Grain Density (g/cm^3)	2.7	0.07	2.93	2.54	29
Water Content (%)	24.32	1.63	27.2	21.1	29
Void Ratio	0.66	0.04	0.74	0.58	29
Porosity (%)	39.62	1.62	42.5	36.9	29
Mean Grain Size (Phi)	1.8	0.60	2.4	0.7	10
Vp (lab)	1745		1791	1701	114

Lower Tampa Bay	**Mean**	**Stdev**	**Max**	**Min**	**Number**
Wet Bulk Density (g/cm^3)	2	0.05	2.08	1.82	78
Grain Density (g/cm^3)	2.64	0.02	2.69	2.6	78
Water Content (%)	28.63	6.38	63.3	15.5	78
Void Ratio	0.76	0.17	1.68	0.41	78
Porosity (%)	42.51	5.87	62.6	29	78
Mean Grain Size (Phi)	2.5	0.39	2.9	1.2	19
Vp (lab)	1730		1782	1637	294

Lower Florida Keys	**Mean**	**Stdev**	**Max**	**Min**	**Number**
Wet Bulk Density (g/cm^3)	1.86	0.09	2.1	1.13	~3800
Grain Density (g/cm^3)	2.76	0.03	2.86	2.66	1208
Water Content (%)	35.11	6.61	83.1	22.3	1208
Void Ratio	1	0.26	3.08	0.6	1222
Porosity (%)	49.6	3.15	75.5	36.9	1351
Mean Grain Size (Phi)	5.7	0.92	2.0	9.2	420
Vp (lab)	1543	28.23	1674	1487	2832
% Calcium Carbonate	90.6	2.16	96.7	83.8	188

3.2.1.1 Boca Raton Physical and Geoacoustic Property Data:

NS01-1
NS01-2
NS02-1
NS02-2
NS03-1
NS03-2
NS04-1
NS04-2
NS05-2
NS05-3
NS06-1
NS06-2
NS07-1
NS07-2

Cruise: Boca Raton **Station: NS-01-1**
lat: 26 19.6 N **long: 80 3.62 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.07	2.75	23.09	0.63	38.81	15.8	82.8	1.3	0.0	1.0
2.4	2.08	2.77	24.25	0.67	40.20					
4-6	2.13	2.80	26.52	0.74	42.61					
6-8	2.09	2.76	27.22	0.75	42.90					
8-10	2.01	2.74	26.99	0.74	42.53					
10-12	2.09	2.78	23.90	0.66	39.94	9.8	88.7	1.5	0.0	1.1
12-14	2.03	2.72	26.04	0.71	41.45					
14-16	2.04	2.74	27.19	0.74	42.69					
16-18	2.03	2.68	25.13	0.67	40.20	1.2	97.2	1.6	0.0	1.6

Cruise: Boca Raton **Station: NS-01-2**
lat: 26 19.6 N **long: 80 3.62 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.00	2.74	28.36	0.78	43.68	0.4	97.6	1.9	0.0	2.5
2.4	2.00	2.73	26.95	0.73	42.34					
4-6	2.03	2.73	27.91	0.76	43.25					
6-8	1.99	2.71	34.72	0.94	48.45					
8-10	2.01	2.72	29.03	0.79	44.14					
10-12	1.99	2.66	27.18	0.72	41.98	0.4	97.5	2.1	0.0	2.7
12-14	1.95	2.69	30.74	0.83	45.24					
14-16	2.01	2.73	28.53	0.78	43.79	0.5	97.3	2.2	0.0	2.7

Cruise: Boca Raton **Station: NS-02-1**
lat: 26 19.6 N **long: 80 3.83 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						0.4	98.6	1.0	0.0	1.6
2-4	2.10	2.76	22.27	0.61	38.08					
4-6	2.10	2.77	22.08	0.61	37.95					
6-8	2.14	2.76	20.70	0.57	36.40					
8-10	2.17	2.77	21.57	0.60	37.40					
10-12						1.9	97.1	1.0	0.0	1.7
12-14	2.08	2.73	23.91	0.65	39.49					
14-16	2.08	2.73	22.40	0.61	37.91					
16-18	2.03	2.71	25.78	0.70	41.13					
18-20						0.4	98.3	1.3	0.0	1.9

Cruise: Boca Raton **Station: NS-02-2**
lat: 26 19.6 N **long: 80 3.83 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.09	2.76	22.86	0.63	38.66					
2-4	2.09	2.72	21.57	0.59	36.95					
4-6	2.09	2.69	21.98	0.59	37.16					
6-8	2.11	2.64	21.93	0.58	36.67					
8-10	2.15	2.80	20.15	0.56	36.02					
10-12	2.09	2.76	22.09	0.61	37.89					
12-14	2.06	2.73	23.36	0.64	38.91					
14-16	2.04	2.68	25.50	0.68	40.63					

Cruise: Boca Raton
lat: 26 19.7 N

Station: NS-03-1
long: 80 3.80 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						0.3	98.3	1.4	0.0	2.2
2.4	2.02	2.70	25.98	0.70	41.25					
4-6	2.03	2.61	25.13	0.66	39.64					
6-8	2.07	2.70	23.64	0.64	38.91					
8-10						0.2	98.5	1.4	0.0	2.4
10-12						0.7	97.1	2.2	0.0	2.5

Cruise: Boca Raton
lat: 26 19.7 N

Station: NS-03-2
long: 80 3.80 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.02	2.73	25.70	0.70	41.20					
2-4	2.01	2.72	27.29	0.74	42.61					
4-6	2.03	2.74	27.04	0.74	42.56					
6-8	2.06	2.75	23.99	0.66	39.75					
8-10	2.07	2.69	24.72	0.67	39.98					
10-12	2.01	2.72	26.25	0.71	41.62					
12-14	2.05	2.71	25.50	0.69	40.87					

Cruise: Boca Raton
lat: 26 19.7 N

Station: NS-04-1
long: 80 3.85 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.12	2.77	21.35	0.59	37.16					
2-4	2.14	2.73	22.92	0.63	38.49					
4-6	2.12	2.75	23.89	0.66	39.64					
6-8	2.10	2.73	23.22	0.63	38.80					
8-10	2.06	2.73	24.10	0.66	39.68					
10-12	2.08	2.73	23.75	0.65	39.33					
12-14	2.12	2.72	22.90	0.62	38.38					

Cruise: Boca Raton
lat: 26 19.7 N

Station: NS-04-2
long: 80 3.85 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						0.2	98.7	1.2	0.0	2.0
2.4	2.10	2.76	22.02	0.61	37.80					
4-6	2.14	2.83	21.39	0.61	37.72					
6-8	2.14	2.81	20.98	0.59	37.12					
8-10	2.08	2.74	22.27	0.61	37.86					
10-12						0.2	98.5	1.4	0.0	2.0
12-14	2.08	2.76	22.66	0.62	38.44					
14-16						0.3	98.2	1.5	0.0	2.0

Cruise: Boca Raton
lat: 26 19.5 N

Station: NS-05-2
long: 80 3.85 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						0.3	98.4	1.3	0.0	1.8
2-4	2.15	2.81	20.74	0.58	36.79					
4-6	2.09	2.74	22.60	0.62	38.21					
6-8	2.10	2.75	22.12	0.61	37.84					
8-10	2.12	2.78	21.66	0.60	37.55					
10-12						1.6	97.3	1.1	0.0	1.5
12-14	2.12	2.75	21.14	0.58	36.73					
14-16	2.10	2.74	22.58	0.62	38.26					
16-18						1.8	96.9	1.2	0.0	1.4

Cruise: Boca Raton
lat: 26 19.5 N

Station: NS-05-3
long: 80 3.85 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.19	2.75	20.89	0.57	36.47					
2-4	2.16	2.75	20.39	0.56	35.89					
4-6	2.12	2.73	22.86	0.62	38.41					
6-8	2.20	2.77	20.35	0.56	36.03					
8-10	2.20	2.75	19.44	0.54	34.86					
10-12	2.16	2.74	20.45	0.56	35.91					
12-14	2.18	2.78	20.26	0.56	36.03					
14-16	2.12	2.74	20.98	0.58	36.52					
16-18	2.18	2.75	20.43	0.56	36.00					
18-20	2.22	2.77	19.23	0.53	34.76					

Cruise: Boca Raton
lat: 26 19.6 N

Station: NS-06-1
long: 80 3.72 W

Depth Interval (cm)	Wet Bulk Density (g/cm³)	Grain Density (g/cm³)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						2.8	95.9	1.3	0.0	2.0
2-4	2.05	2.79	27.09	0.76	43.04					
4-6	2.02	2.78	31.81	0.88	46.93					
6-8	2.00	2.83	34.33	0.97	49.28					
8-10	1.96	2.80	33.82	0.95	48.64					
10-12						3.9	94.0	2.1	0.0	1.3
12-14	1.89	2.80	41.06	1.15	53.48					
14-16	1.88	2.79	39.47	1.10	52.41					
16-18						14.4	83.6	2.1	0.0	1.3

Cruise: Boca Raton
lat: 26 19.6 N

Station: NS-06-2
long: 80 3.72 W

Depth Interval (cm)	Wet Bulk Density (g/cm³)	Grain Density (g/cm³)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.00	2.76	30.15	0.83	45.42					
2-4	1.98	2.78	32.61	0.91	47.55					
4-6	2.00	2.73	28.41	0.78	43.68					
6-8	2.06	2.76	25.19	0.69	40.99					
8-10	2.02	2.74	27.70	0.76	43.15					
10-12	2.03	2.74	27.91	0.76	43.33					
12-14	2.08	2.77	26.79	0.74	42.60					
14-16	2.05	2.72	25.41	0.69	40.86					
16-18	2.03	2.77	29.56	0.82	45.02					

Cruise: Boca Raton **Station: NS-07-1**
lat: 26 19.5 N **long: 80 3.80 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2						0.2	98.7	1.1	0.0	2.1
2-4	2.07	2.73	23.91	0.65	39.48					
4-6	2.07	2.72	23.50	0.64	39.03					
6-8	2.06	2.72	24.93	0.68	40.38					
8-10	2.07	2.77	24.58	0.68	40.48					
10-12						0.3	98.0	1.7	0.0	2.2
12-14	2.02	2.72	26.08	0.71	41.46					
14-16	2.08	2.76	24.13	0.67	39.98					
16-18	2.13	2.77	28.36	0.79	43.99					
18-20	2.07	2.83	23.88	0.68	40.36					
20-22						0.6	98.5	0.9	0.0	2.1

Cruise: Boca Raton **Station: NS-07-2**
lat: 26 19.5 N **long: 80 3.80 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel %	Sand %	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	2.14	2.77	23.72	0.66	39.65					
2-4	2.06	2.74	25.26	0.69	40.90					
4-6	2.09	2.75	25.10	0.69	40.84					
6-8	2.12	2.78	25.40	0.71	41.39					
8-10	2.10	2.73	24.24	0.66	39.82					
10-12	2.08	2.73	25.04	0.68	40.60					
12-14	2.07	2.78	25.32	0.70	41.31					
14-16	2.09	2.80	26.96	0.75	43.02					
16-18	2.16	2.81	22.98	0.65	39.23					
18-20	2.16	2.79	22.76	0.64	38.84					
20-22	2.06	2.73	26.12	0.71	41.63					

3.2.1.2 Dry Tortugas Physical and Geoacoustic Property Data:

KW-PE-DC-140-1
KW-PE-DC-140-2
KW-PE-GC-147
KW-PE-DC-160-2
KW-PE-DC-160-3
KW-PE-GC-167
KW-PE-DC-176-2
KW-PE-DC-176-3
KW-PE-GC-178
KW-PE-GC-208
KW-PE-GC-210
KW-PE-GC-213
KW-PE-GC-218
KW-PE-GC-220
KW-PE-GC-222
KW-PE-GC-224
KW-PE-GC-225
KW-PE-GC-227

KW-PE-DC-140-1

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%) C.Log.	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	p-wave velocity (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.64	2.71	57.04	58.74	1.51	60.17	0.0	29.5	51.8	18.7	5.5	1503	1.62
2-4	1.66	2.73	54.42	55.72	1.45	59.18						1530	2.51
4-6	1.72	2.74	47.81	48.76	1.28	56.15						1534	2.55
6-8	1.78	2.75	41.96	47.26	1.13	52.96						1544	2.66
8-10	1.76	2.75	44.26	45.57	1.19	54.31	0.3	32.6	50.7	16.5	5.2	1550	2.76
10-12	1.76	2.75	43.65	45.08	1.17	53.98	0.9	31.4	47.5	20.3	5.7	1544	2.71
12-14	1.75	2.76	45.51	43.29	1.23	55.07						1544	2.72
14-16	1.79												
16-18	1.78											1537	2.74
18-20													
MEAN	1.74	2.74	47.81	49.20	1.28	55.97	0.31	31.11	49.91	18.41	5.41	1536	2.53

KW-PE-DC-140-2

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	p-wave velocity (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.75											
2-4	1.79										1521	2.73
4-6	1.80										1523	2.74
6-8	1.82										1530	2.79
8-10	1.83										1534	2.81
10-12	1.83										1530	2.80
12-14	1.86										1539	2.86
14-16	1.84											
16-18	1.86										1524	2.83
18-20	1.88											
MEAN	1.83										1529	3

KW-PE-GC-147

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.68	2.72	58.18	1.58	61.26	0.0	21.0	56.9	22.1	6.2	2.83	0.45	1.16	92.1		
2-4	1.68	2.70	57.99	1.57	61.04									91.8		
4-6	1.75	2.73	51.07	1.39	58.20									91.7	1500	2.59
6-8	1.70	2.73	55.05	1.50	60.08									90.4	1500	2.62
8-10	1.76	2.73	47.76	1.30	56.60									91.8	1500	2.67
10-12	1.76	2.75	47.92	1.32	56.86	0.1	25.9	54.4	19.6	5.9	2.86	0.42	1.21	88.4	1505	2.73
12-14	1.80	2.73	44.15	1.21	54.69									91.1	1502	2.70
14-16	1.78	2.74	45.41	1.24	55.41									88.8	1508	2.75
16-18	1.78	2.72	46.44	1.26	55.81									91.6	1508	2.70
18-20	1.79	2.74	46.16	1.26	55.83									88.7	1507	2.72
20-22	1.82	2.72	42.81	1.16	53.79	0.9	31.4	47.6	20.1	5.6	3.15	0.39	1.40	90.1	1504	2.74
22-24	1.80	2.71	43.99	1.19	54.41									90.7	1507	2.74
24-26	1.80	2.75	45.29	1.24	55.43									90	1505	2.71
26-28	1.80	2.79	44.53	1.24	55.38									90	1504	2.72
28-30	1.82	2.79	43.10	1.20	54.56									90.1	1503	2.72
30-32	1.82	2.76	41.58	1.15	53.41	2.1	39.8	39.8	18.3	5.4	3.24	0.35	1.23	90.8	1507	2.78
32-34	1.84	2.74	40.65	1.11	52.65									90.9	1507	2.78
34-36	1.85	2.76	40.57	1.12	52.83									91.2	1512	2.76
36-38	1.84	2.77	41.41	1.15	53.44									90.5	1510	2.78
38-40	1.86	2.72	38.63	1.05	51.24									90.1	1515	2.80
40-42	1.87	2.75	37.94	1.04	51.06	3.7	42.9	34.1	19.3	5.1	3.69	0.30	1.30	90.5	1516	2.82
42-44	1.87	2.75	37.97	1.04	51.07									90.2	1511	2.83
44-46	1.86	2.72	39.04	1.06	51.51									96.7	1517	2.85
46-48	1.86	2.80	39.03	1.09	52.25									91.6	1520	2.83
48-50	1.81	2.72	43.22	1.18	54.06									92.8	1522	2.81
50-52	1.84	2.75	40.83	1.12	52.89	3.7	47.8	31.4	17.1	5.4	2.46	0.93	1.26	92	1516	2.82
52-54	1.89	2.74	36.81	1.01	50.18									91.9	1511	2.80
54-56	1.89	2.80	37.08	1.04	50.93									91.4	1522	2.85
56-58	1.86	2.78	39.65	1.10	52.46									91.4	1519	2.86
58-60	1.87	2.78	37.98	1.06	51.41									91.5	1517	2.84
60-62	1.87	2.77	38.90	1.08	51.83	4.5	49.8	27.8	17.9	5.5	2.54	0.94	1.26	92.7	1523	2.84
62-64	1.88	2.76	38.14	1.05	51.30									90.1	1510	2.80
64-66	1.92	2.75	34.65	0.95	48.82									88.1	1516	2.87
66-68	1.89	2.75	36.48	1.00	50.09									89.9	1522	2.87
68-70	1.89	2.74	35.98	0.99	49.68									88.1	1521	2.85
70-72	1.91	2.77	34.81	0.97	49.12	4.1	50.2	29.6	16.1	5.3	2.30	0.93	1.21	91.9	1516	2.86
72-74	1.88	2.74	37.44	1.03	50.63									91.6	1527	2.85
74-76	1.88	2.74	37.25	1.02	50.53									90	1530	2.90
76-78	1.89	2.76	36.48	1.01	50.18									89.3	1525	2.89
78-80	1.92	2.74	34.25	0.94	48.39									89.7	1525	2.85
80-82	1.90	2.76	35.69	0.98	49.59	5.4	47.9	26.9	19.8	5.7	3.46	0.60	1.85	90.9	1532	2.91

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
82-84	1.93	2.74	33.31	0.91	47.72									92.3	1532	2.95
84-86	1.94	2.77	32.64	0.90	47.44									91.7	1532	2.91
86-88	1.96	2.76	30.30	0.83	45.50									91.8	1533	2.86
88-90	2.01	2.73	26.37	0.72	41.82	9.1	46.1	25.7	19.1	5.6	3.38	0.59	1.96	91.6	1532	3.04
90-92	1.96	2.77	31.18	0.86	46.30	9.6	46.1	26.0	18.4	4.6	4.14	0.25	1.17	93.7		
92-94	1.97	2.73	30.81	0.84	45.66									92.1		
94-96	1.97	2.73	29.85	0.81	44.87									94.1		
96-98	1.98	2.77	29.28	0.81	44.78									90.4	1552	2.93
98-100	1.95	2.77	33.08	0.92	47.81									94.5	1532	2.81
100-102	1.95	2.79	33.05	0.92	47.96	6.4	48.2	24.8	20.7	4.8	4.24	0.29	1.13	91.7		
102-104	1.92	2.72	34.48	0.94	48.42									93	1549	2.79
104-106	1.92	2.76	33.88	0.93	48.29									91.9	1549	2.82
106-108	1.91	2.76	35.65	0.98	49.62									93		
108-110	1.94	2.75	33.28	0.92	47.80									93.5		
110-112	1.95	2.78	32.58	0.91	47.55	10.8	42.1	24.9	22.2	4.6	4.74	0.21	1.05	94.1	1510	2.75
112-114	1.92	2.74	34.20	0.94	48.41									91.2	1537	2.90
114-116	1.94	2.75	32.91	0.91	47.52									92.1	1545	2.96
116-118	1.93	2.75	33.33	0.92	47.86									88.9	1545	3.01
118-120	1.96	2.75	31.84	0.88	46.70									92.2	1544	3.00
120-122	1.91	2.75	34.85	0.96	48.98	7.4	46.7	24.0	22.6	4.5	4.05	0.24	0.96	92.1	1542	2.95
122-124	1.93	2.76	33.26	0.92	47.82									92.6	1533	2.96
124-126	1.93	2.78	34.38	0.96	48.87									91.3	1532	2.91
126-128	1.96	2.78	33.25	0.92	48.00									90.5	1544	2.96
128-130	1.98	2.78	31.02	0.86	46.26									90.6	1560	3.02
130-132	1.95	2.75	31.44	0.86	46.33	7.9	40.3	26.3	25.6	5.2	4.52	0.28	0.92	88.1	1561	3.05
132-133	1.97	2.73	29.84	0.81	44.90									88.7	1566	3.05
133-136	1.98	2.75	30.25	0.83	45.45									87.8	1561	3.11
136-138	1.98	2.79	30.79	0.86	46.23									88.6	1549	3.03
138-140	1.93	2.77	33.59	0.93	48.20									88	1561	3.02
140-142	1.94	2.75	32.72	0.90	47.35	6.4	41.8	23.7	28.1	5.6	4.39	0.36	0.93	89.1	1563	3.05
142-144	1.93	2.75	33.58	0.92	48.00									90.5	1557	3.07
144-146	1.93	2.75	33.23	0.91	47.76									90.9	1560	3.04
146-148	1.94	2.77	32.41	0.90	47.28									89.4	1551	3.04
148-150	1.93	2.75	33.12	0.91	47.67									90.2	1546	3.01
150-152	1.94	2.75	32.93	0.90	47.50	4.8	44.3	22.6	28.3	5.6	4.20	0.41	0.90	91.9	1545	3.02
152-154	1.97	2.76	30.82	0.85	45.97									89	1544	2.97
154-156	1.96	2.83	32.44	0.92	47.86									89.3	1537	2.98
156-158	1.96	2.77	31.98	0.89	46.99									86.1	1556	2.99
158-160	1.91	2.75	34.03	0.94	48.35									89.6	1556	3.04
160-162	1.93	2.76	32.94	0.91	47.64	3.0	37.9	25.9	33.3	6.0	4.36	0.39	0.78	90.4	1555	3.05
162-164	1.97	2.78	31.72	0.88	46.89									85.9	1554	3.04
164-166	1.98	2.76	30.66	0.85	45.87									86.4	1552	3.01
166-168	1.92	2.75	34.03	0.94	48.35									89.3	1547	3.02
168-170	1.85	2.75	39.98	1.10	52.41									90.2	1539	2.98
170-172	1.93	2.72	34.00	0.92	48.02	5.0	35.4	27.7	31.9	6.0	4.35	0.30	0.81	91.1	1526	2.90

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
172-174	1.82	2.71	41.00	1.11	52.62									86.4	1537	2.88
174-176	1.84	2.73	38.66	1.06	51.37									87.3	1522	2.87
176-178	1.91	2.75	34.66	0.95	48.85									87.4	1511	2.84
178-180	1.86	2.71	37.51	1.02	50.43									87.5	1521	2.87
180-182	1.90	2.74	34.30	0.94	48.45	1.2	25.8	35.4	37.6	6.9	4.06	0.26	0.79	84.2	1522	2.89
MEAN	1.89	2.75	36.96	1.02	50.11	4.8	40.6	31.8	22.9	5.5	3.65	0.44	1.16	90.5	1529	2.88

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Sample Depth (cm)	Initial Wt. (g)	Final Wt. (g)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	Sorting	Skewness	Kurtosis
0.0	12.809	7.263	1.56	2.72	76.36	2.08	67.50	0.5	30.5	49.8	19.2	5.5	3.05	0.19	1.21
0.5	13.3559	8.350	1.66	2.71	59.95	1.62	61.90	0.3	33.2	47.3	19.2	5.5	3.11	0.22	1.15
1.0	12.358	7.946	1.69	2.72	55.52	1.51	60.16	0.3	34.8	46.5	18.4	5.4	3.07	0.23	1.14
1.5	8.459	5.587	1.73	2.72	51.41	1.40	58.30	0.6	35.6	47.2	16.7	5.2	2.98	0.25	1.18
2.0	9.934	6.536	1.73	2.74	51.99	1.42	58.75	0.5	35.8	46.3	17.4	5.3	3.00	0.24	1.15
2.5	8.749	5.860	1.75	2.73	49.30	1.35	57.37	0.5	36.1	47.1	16.4	5.2	2.96	0.23	1.15
3.0	8.835	5.937	1.75	2.74	48.81	1.34	57.22								
3.5	10.356	6.880	1.73	2.75	50.52	1.39	58.15	0.6	35.2	46.9	17.3	5.3	3.00	0.25	1.15
4.0 A	3.448	2.335	1.73*	2.68	47.67	1.28	56.09	0.4	34.8	47.2	17.6	5.3	2.99	0.28	1.14
4.0 B	3.501	2.384	1.73*	2.74	46.85	1.28	56.21								
4.0 C	3.734	2.485	1.73*	2.71	50.26	1.36	57.66								
4.0 D	3.622	2.479	1.73*	2.68	46.11	1.24	55.27								
4.0 E	3.449	2.349	1.73*	2.73	46.83	1.28	56.11								
4.5 A	3.316	2.279	1.73*	2.72	45.50	1.24	55.31	0.6	34.9	46.6	17.9	5.3	3.07	0.26	1.16
4.5 B	3.288	2.213	1.73*	2.70	48.58	1.31	56.74								
4.5 C	3.109	2.065	1.73*	2.71	50.56	1.37	57.81								
4.5 D	3.188	2.193	1.73*	2.71	45.37	1.23	55.15								
4.5 E	3.353	2.313	1.73*	2.72	44.96	1.22	55.02								
5.0 A	3.303	2.288	1.73	2.69	44.36	1.19	54.41	0.4	37.1	45.5	17.0	5.2	3.03	0.26	1.13
5.0 B	3.535	2.423	1.73	2.72	45.89	1.25	55.52								
5.0 C	3.224	2.220	1.72	2.77	45.23	1.25	55.61								
5.0 D	3.495	2.438	1.74	2.73	43.36	1.18	54.20								
5.0 E	3.415	2.381	1.71	2.73	43.43	1.19	54.25								
5.5 A	3.481	2.428	1.71	2.74	43.37	1.19	54.30								
5.5 B	3.429	2.391	1.71	2.70	43.41	1.17	53.96								
5.5 C	3.634	2.558	1.71	2.71	42.06	1.14	53.27								
5.5 D	3.570	2.520	1.78	2.72	41.67	1.13	53.13								
5.5 E	3.693	2.603	1.73	2.70	41.87	1.13	53.07								
6.0 A	3.565	2.480	1.72	2.76	43.75	1.21	54.70	0.4	38.5	44.5	16.6	5.1	3.04	0.22	1.11
6.0 B	3.653	2.589	1.73	2.75	41.10	1.13	53.06								
6.0 C	3.548	2.482	1.70	2.75	42.95	1.18	54.15								
6.0 D	3.630	2.585	1.73	2.78	40.43	1.12	52.92								
6.0 E	3.587	2.529	1.77	2.70	41.83	1.13	53.04								
6.5 A	3.688	2.566	1.70	2.72	43.73	1.19	54.32	0.8	37.5	44.6	17.1	5.2	3.08	0.22	1.15
6.5 B	4.417	3.103	1.77	2.74	42.35	1.16	53.71								
6.5 C	3.940	2.779	1.77	2.73	41.78	1.14	53.28								
6.5 D	4.100	2.931	1.79	2.73	39.88	1.09	52.13								
6.5 E	3.740	2.634	1.75	2.75	41.99	1.15	53.59								
7.0 A	3.382	2.349	1.74	2.76	43.98	1.21	54.83	0.5	37.5	45.4	16.7	5.2	3.02	0.23	1.15
7.0 B	3.345	2.346	1.75	2.72	42.58	1.16	53.67								
7.0 C	3.584	2.521	1.77	2.74	42.17	1.16	53.60								
7.0 D	3.354	2.407	1.77	2.73	39.34	1.07	51.79								

Sample Depth (cm)	Initial Wt. (g)	Final Wt. (g)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	Sorting	Skewness	Kurtosis
7.0 E	3.761	2.682	1.78	2.72	40.23	1.09	52.25								
7.5 A	3.759	2.675	1.79	2.73	40.52	1.11	52.52	0.4	37.2	45.1	17.3	5.3	3.06	0.25	1.14
7.5 B	3.523	2.452	1.75	2.70	43.68	1.18	54.11								
7.5 C	3.984	2.898	1.80	2.71	37.47	1.02	50.39								
7.5 D	3.876	2.763	1.78	2.73	40.28	1.10	52.37								
7.5 E	3.749	2.672	1.78	2.70	40.31	1.09	52.11								
8.0 A	3.381	2.368	1.73	2.71	42.78	1.16	53.69	0.8	34.3	46.6	18.4	5.4	3.09	0.29	1.22
8.0 B	3.444	2.402	1.75	2.71	43.38	1.18	54.04								
8.0 C	3.341	2.339	1.73	2.72	42.84	1.17	53.82								
8.0 D	3.297	2.340	1.72	2.71	40.90	1.11	52.57								
8.0 E	3.465	2.463	1.77	2.72	40.68	1.11	52.53								
8.5 A	3.694	2.562	1.72	2.74	44.18	1.21	54.76	0.9	36.8	44.2	18.1	5.3	3.16	0.25	1.21
8.5 B	3.685	2.631	1.75	2.71	40.06	1.09	52.05								
8.5 C	3.669	2.626	1.78	2.72	39.72	1.08	51.93								
8.5 D	3.344	2.333	1.74	2.71	43.33	1.17	54.01								
8.5 E	3.723	2.639	1.79	2.72	41.08	1.12	52.77								
9.0 A	3.577	2.539	1.82	2.71	40.88	1.11	52.56	1.6	37.2	44.4	16.8	5.2	3.13	0.24	1.23
9.0 B	3.457	2.489	1.81	2.73	38.89	1.06	51.50								
9.0 C	3.365	2.448	1.83	2.72	37.46	1.02	50.47								
9.0 D	3.488	2.475	1.79	2.73	40.93	1.12	52.77								
9.0 E	3.300	2.375	1.81	2.74	38.95	1.07	51.62								
9.5 A	3.615	2.625	1.80	2.74	37.71	1.03	50.82	0.9	38.8	43.2	17.2	5.2	3.13	0.25	1.17
9.5 B	3.498	2.551	1.79	2.73	37.12	1.01	50.33								
9.5 C	3.556	2.568	1.77	2.73	38.47	1.05	51.23								
9.5 D	3.659	2.661	1.83	2.74	37.50	1.03	50.68								
9.5 E	3.584	2.579	1.78	2.73	38.97	1.06	51.55								
10.0 A	3.539	2.587	1.85	2.75	36.80	1.01	50.30	0.5	39.8	42.2	17.5	5.2	3.13	0.26	1.14
10.0 B	3.580	2.624	1.81	2.75	36.43	1.00	50.05								
10.0 C	3.608	2.608	1.84	2.72	38.34	1.04	51.05								
10.0 D	3.471	2.543	1.84	2.71	36.49	0.99	49.72								
10.0 E	3.665	2.654	1.82	2.76	38.09	1.05	51.25								
10.5 A	3.499	2.545	1.85	2.70	37.49	1.01	50.30	0.7	39.5	42.2	17.6	5.2	3.16	0.24	1.17
10.5 B	3.725	2.728	1.85	2.71	36.55	0.99	49.76								
10.5 C	3.815	2.807	1.86	2.71	35.91	0.97	49.32								
10.5 D	4.202	3.094	1.87	2.77	35.81	0.99	49.80								
10.5 E	3.793	2.770	1.83	2.74	36.93	1.01	50.30								
11.0 A	3.387	2.433	1.80	2.73	39.21	1.07	51.70	0.7	39.6	42.6	17.1	5.1	3.13	0.24	1.16
11.0 B	3.661	2.670	1.84	2.71	37.12	1.01	50.15								
11.0 C	2.772	2.038	1.84	2.74	36.02	0.99	49.67								
11.0 D	3.336	2.456	1.86	2.74	35.83	0.98	49.54								
11.0 E	3.023	2.217	1.83	2.78	36.36	1.01	50.27								
11.5 A	3.987	2.926	1.84	2.74	36.26	0.99	49.84	1.2	40.2	40.9	17.7	5.2	3.23	0.23	1.16
11.5 B	3.775	2.743	1.82	2.75	37.62	1.03	50.85								
11.5 C	3.242	2.412	1.86	2.74	34.41	0.94	48.53								

Sample Depth (cm)	Initial Wt. (g)	Final Wt. (g)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	Sorting	Skewness	Kurtosis
11.5 D	3.792	2.790	1.84	2.71	35.91	0.97	49.32								
11.5 E	3.735	2.740	1.83	2.75	36.31	1.00	49.97								
12.0 A	3.932	2.900	1.86	2.73	35.59	0.97	49.28	1.1	40.2	41.5	17.2	5.1	3.17	0.25	1.09
12.0 B	3.444	2.522	1.81	2.71	36.56	0.99	49.77								
12.0 C	3.930	2.916	1.85	2.73	34.77	0.95	48.70								
12.0 D	3.429	2.511	1.81	2.74	36.56	1.00	50.04								
12.0 E	4.334	3.195	1.87	2.70	35.65	0.96	49.05								
12.5 A	2.913	2.155	1.84	2.75	35.17	0.97	49.17	1.0	39.1	41.1	18.8	5.4	3.31	0.25	1.18
12.5 B	3.693	2.729	1.88	2.71	35.32	0.96	48.91								
12.5 C	3.260	2.432	1.80	2.74	34.05	0.93	48.26								
12.5 D	3.311	2.431	1.82	2.76	36.20	1.00	49.98								
12.5 E	2.560	1.893	1.83	2.75	35.24	0.97	49.21								
13.0 A	3.541	2.636	1.83	2.76	34.33	0.95	48.65	1.7	35.3	42.6	20.5	5.3	3.30	0.29	1.27
13.0 B	3.114	2.308	1.83	2.74	34.92	0.96	48.90								
13.0 C	3.159	2.373	1.84	2.72	33.12	0.90	47.39								
13.0 D	2.070	1.535	1.85	2.72	34.85	0.95	48.67								
13.0 E	3.340	2.461	1.85	2.75	35.72	0.98	49.55								
13.5 A	3.953	2.938	1.85	2.72	34.55	0.94	48.45	2.1	40.6	39.9	17.4	5.1	3.37	0.23	1.20
13.5 B	3.320	2.462	1.89	2.74	34.85	0.95	48.85								
13.5 C	3.916	2.911	1.92	2.72	34.52	0.94	48.43								
13.5 D	4.101	3.072	1.88	2.74	33.50	0.92	47.86								
13.5 E	3.375	2.510	1.84	2.72	34.46	0.94	48.38								
14.0	12.263	9.169	1.92	2.75	33.74	0.93	48.13	1.9	35.5	46.2	16.4	5.1	3.12	0.24	1.26
14.5	7.443	5.521	1.90	2.78	34.81	0.97	49.18								
15.5	9.475	6.960	1.88	2.75	36.14	0.99	49.84	1.0	38.5	43.2	17.3	5.1	3.17	0.24	1.16

* Assumed, not measured

KW-PE-DC-160-3

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)
0-2	1.63	2.69	65.67	1.51	60.20	0.1	34.5	46.9	18.5	5.3
2-4	1.72	2.72	52.83	1.23	55.06	0.5	35.8	46.9	16.8	5.2
4-6	1.72	2.72	49.26	1.23	55.18	0.4	36.5	47.7	15.5	5.0
6-8	1.74	2.72	48.38	1.18	54.06	0.2	38.4	45.2	16.2	5.1
8-10	1.77	2.72	45.15	1.12	52.75	1.2	36.6	43.7	18.5	5.5
10-12	1.80	2.72	41.96	1.04	50.95					
12-14	1.83									
14-16	1.76									
16-18	1.86									
18-20	1.84									
MEAN	1.77	2.71	50.54	1.22	54.70	0.5	36.3	46.1	17.1	5.2

KW-PE-GC-167

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Sorting	Skewness	Kurtosis	MGS (Phi)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.56	2.70	67.13	1.81	64.44	0.5	29.9	49.0	20.7	3.20	0.37	1.18	5.8	1536	1.53
2-4	1.70	2.72	53.31	1.45	59.17									1540	1.56
4-6	1.73	2.71	56.59	1.53	60.52									1548	1.71
6-8	1.73	2.71	52.62	1.43	58.81									1546	1.72
8-10	1.76	2.71	49.11	1.33	57.11									1548	1.82
10-12	1.75	2.72	46.92	1.28	56.06	3.2	40.0	39.6	17.2	3.46	0.23	1.31	4.9	1554	1.89
12-14	1.86	2.71	46.30	1.26	55.69									1543	1.81
14-16	1.83	2.72	43.08	1.17	53.93									1549	1.90
16-18	1.80	2.72	49.83	1.35	57.50									1554	1.95
18-20	1.82	2.72	41.71	1.13	53.16									1554	1.99
20-22	1.85	2.72	42.26	1.15	53.49	2.3	40.9	39.6	17.2	3.36	0.30	1.30	4.9	1554	1.95
22-24	1.85	2.72	41.03	1.12	52.77									1554	1.98
24-26	1.84	2.72	40.44	1.10	52.42									1563	2.04
26-28	1.85	2.72	39.71	1.08	51.93									1558	2.00
28-30	1.92	2.72	38.12	1.04	50.93									1569	2.11
30-32	1.88	2.72	40.61	1.10	52.46	4.5	47.5	33.0	15.0	3.33	0.31	1.71	4.5	1571	2.09
32-34	1.89	2.72	38.15	1.04	50.91									1566	2.12
34-36	1.91	2.72	39.20	1.07	51.58									1569	2.08
36-38	1.87	2.73	38.59	1.05	51.26									1570	2.08
38-40	1.86	2.73	38.71	1.06	51.34									1574	2.06
40-42	1.85	2.74	41.08	1.12	52.93	3.9	47.8	32.5	15.9	3.38	0.32	1.75	4.6	1572	2.08
42-44	1.88	2.74	39.87	1.09	52.20									1572	2.11
44-46	1.89	2.73	39.13	1.07	51.65									1571	2.10
46-48	1.88	2.73	39.88	1.09	52.11									1566	2.06
48-50	1.88	2.73	39.50	1.08	51.90									1569	2.06
50-52	1.88	2.73	39.03	1.06	51.57	7.8	44.4	31.0	16.8	3.76	0.24	1.49	4.7	1558	2.05
52-54	1.87	2.73	39.59	1.08	51.94									1561	2.09
54-56	1.89	2.73	37.76	1.03	50.76									1567	2.11
56-58	1.89	2.73	35.44	0.97	49.17									1567	2.11
58-60	1.91	2.72	36.62	1.00	49.94									1565	2.07
60-62	1.88	2.72	37.60	1.02	50.58	4.7	48.8	29.5	17.0	3.49	0.34	1.32	4.7	1558	2.07
62-64	1.95	2.72	37.19	1.01	50.28									1561	2.16
64-66	1.90	2.74	38.04	1.04	51.04									1559	2.11
66-68	1.91	2.72	36.51	0.99	49.87									1559	2.08
68-70	1.91	2.73	34.65	0.95	48.63									1561	2.09
70-72	1.91	2.73	37.06	1.01	50.31	13.6	43.1	27.0	16.3				4.0	1559	2.15
72-74	1.91	2.73	35.98	0.98	49.55									1565	2.13
74-76	1.90	2.73	38.04	1.04	50.98									1562	2.10
76-78	1.93	2.74	36.87	1.01	50.23									1568	2.14
78-80	1.95	2.72	34.89	0.95	48.73									1561	2.14
80-82	1.95	2.74	31.65	0.87	46.40	15.9	43.0	24.0	17.1	4.35	0.27	1.18	3.7	1562	2.16
82-84	1.97	2.74	32.88	0.90	47.39									1565	2.09

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Sorting	Skewness	Kurtosis	MGS (Phi)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.95	2.73	30.10	0.82	45.07									1557	2.17
86-88	1.99	2.73	28.73	0.78	43.95									1562	2.14
88-90	1.95	2.74	32.47	0.89	47.08									1568	2.20
90-92	1.94	2.74	31.21	0.86	46.12	13.7	43.1	24.4	19.0	4.50	0.17	1.07	4.2	1572	2.22
92-94	1.94	2.74	31.90	0.87	46.66									1556	2.20
94-96	1.96	2.73	35.86	0.98	49.46									1677	2.39
96-98	1.96	2.74	33.67	0.92	47.94									1570	2.21
98-100	1.95	2.74	33.03	0.90	47.49									1567	2.21
100-102	2.02	2.76	30.59	0.84	45.79	35.7	26.1	22.6	15.6	4.68	0.30	0.78	2.6	1582	2.21
102-104	1.98	2.74	31.89	0.87	46.64									1577	2.27
104-106	2.02	2.75	29.01	0.80	44.36									1570	2.20
106-110	2.06	2.74	24.96	0.68	40.65									1572	2.25
MEAN	1.89	2.73	38.82	1.06	51.02	9.6	41.3	32.0	17.1	3.75	0.29	1.31	4.4	1564	2.06

KW-PE-DC-176-2

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	p-wave velocity (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.64	2.71	72.33	1.51	60.24	0.1	25.1	52.2	22.6	5.9	1529	2.00
2-4	1.71	2.73	56.17	1.30	56.58	0.1	29.8	52.5	17.5	5.4		
4-6	1.74	2.74	48.77	1.23	55.24	0.6	27.1	52.2	20.1	5.8	1535	2.62
6-8	1.74	2.74	49.13	1.23	55.12	0.2	32.7	50.8	16.3	5.2	1543	2.68
8-10	1.75	2.75	48.51	1.20	54.47						1538	2.67
10-12	1.77	2.74	46.24	1.14	53.30	0.3	27.8	54.3	17.6	5.5	1542	2.70
12-14	1.72	2.74	44.26	1.28	56.10	0.5	23.8	63.7	12.1	5.5	1542	2.73
14-16	1.80	2.75	41.30	1.06	51.55							
MEAN	1.73	2.74	50.84	1.25	55.33	0.3	27.7	54.3	17.7	5.6	1538	2.57

KW-PE-DC-176-3

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Wet Bulk Density (g/cm^3) After	Water Content (%) C.Log	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	p-wave velocity (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.49	2.70		84.70	62.22	2.23	69.06	0.0	23.6	55.9	20.5	5.9		
2-4	1.68	2.72		52.30	52.66	1.39	58.16						1525	2.56
4-6	1.75	2.72		44.35	50.36	1.18	54.09						1534	2.68
6-8	1.77	2.72		42.14	49.37	1.12	52.79						1537	2.71
8-10	1.75	2.73		44.50	46.72	1.18	54.22	0.3	28.1	50.2	21.4	5.6	1536	2.68
10-12	1.77	2.72	1.94	41.77	45.39	1.11	52.61						1537	2.72
12-14	1.78												1534	2.73
14-16	1.78												1536	2.74
16-18	1.78												1540	2.74
18-20	1.81												1543	2.79
20-22	1.80												1536	2.77
22-24	1.78													
24-26	1.83													
26-28	1.24													
MEAN	1.71	2.72	1.94	51.63	51.12	1.37	56.82	0.2	25.9	53.0	20.9	5.8	1536	2.71

KW-PE-GC-178

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.74	2.71	44.30	1.17	53.93	2.2	39.7	44.7	13.3	4.5	2.93	0.15	1.67	90.6		
2-4	1.78	2.76	42.47	1.14	53.36											
4-6	1.72	2.71	47.27	1.25	55.56											
6-8	1.73	2.72	45.43	1.21	54.66											
8-10	1.73	2.75	46.86	1.26	55.68											
10-12	1.75	2.74	45.04	1.21	54.66	0.7	28.1	51.5	19.8	5.8	3.18	0.42	1.30	91.3		
12-14	1.73	2.74	46.60	1.25	55.48											
14-16	1.75	2.71	43.72	1.16	53.66											
16-18	1.77	2.74	42.99	1.15	53.52											
18-20	1.73	2.74	46.75	1.25	55.56											
20-22	1.80	2.73	38.88	1.04	50.87	0.7	30.4	48.6	20.3	5.7	3.17	0.41	1.28	91.6		
22-24	1.80	2.73	39.38	1.05	51.25											
24-26	1.77	2.72	41.50	1.10	52.40											
26-28	1.75	2.73	44.76	1.19	54.43											
28-30	1.81	2.73	38.26	1.02	50.52											
30-32	1.82	2.71	36.69	0.97	49.24	1.5	38.8	42.4	17.2	5.2	3.30	0.34	1.38	91.1		
32-34	1.84	2.73	35.91	0.96	48.94											
34-36	1.85	2.72	34.67	0.92	47.97											
36-38	1.82	2.73	37.34	1.00	49.91											
38-40	1.81	2.73	38.20	1.02	50.48											
40-42	1.84	2.76	36.85	0.99	49.86	1.3	45.4	36.6	16.7	5.0	3.17	0.40	1.52	92.2		
42-44	1.84	2.75	36.79	0.99	49.71											
44-46	1.83	2.73	36.92	0.98	49.61											
46-48	1.82	2.74	37.39	1.00	49.97											
48-50	1.82	2.73	37.81	1.01	50.19											
50-52	1.82	2.73	37.46	1.00	49.97	3.1	44.8	33.8	18.3	5.1	3.58	0.34	1.35	93.1	1578	2.87
52-54	1.84	2.74	36.40	0.97	49.35											
54-56	1.78	2.73	40.84	1.09	52.11										1570	2.80
56-58	1.81	2.73	38.30	1.02	50.53										1570	2.84
58-60	1.81	2.73	38.34	1.02	50.55										1576	2.85
60-62	1.82	2.73	37.31	0.99	49.85	2.0	44.0	36.1	17.9	5.1	3.39	0.37	1.30	91.2	1571	2.86
62-64	1.79	2.74	40.52	1.09	52.04										1567	2.81
64-66	1.85	2.74	35.30	0.94	48.57										1576	2.91
66-68	1.80	2.75	40.19	1.08	51.89										1564	2.81
68-70	1.83	2.72	36.72	0.98	49.41										1567	2.86
70-72	1.81	2.75	38.78	1.04	51.04	2.4	44.2	35.3	18.1	5.0	3.54	0.34	1.29	91.4	1564	2.84
72-74	1.82	2.74	37.72	1.01	50.22										1565	2.85
74-76	1.83	2.73	36.44	0.97	49.30										1565	2.87
76-78	1.84	2.74	35.73	0.95	48.84										1563	2.88
78-80	1.85	2.74	35.01	0.94	48.36										1568	2.91
80-82	1.85	2.73	34.45	0.92	47.84	0.0	36.5	44.2	19.3	5.5	3.03	0.45	1.23	90.4	1569	2.91
82-84	1.84	2.73	35.83	0.95	48.83											

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.88	2.71	32.40	0.86	46.20										1538	2.89
86-88	1.82	2.74	37.93	1.02	50.39											
88-90	1.83	2.74	36.69	0.98	49.51										1578	2.89
90-92	1.85	2.73	34.71	0.92	48.05	4.1	46.8	30.7	18.4	4.7	3.87	0.31	1.29	90.7	1581	2.93
92-94	1.88	2.73	32.46	0.86	46.36										1568	2.95
94-96	1.87	2.73	33.49	0.89	47.13										1574	2.94
96-98	1.87	2.73	32.96	0.88	46.75										1571	2.94
98-100	1.87	2.73	33.82	0.90	47.46										1578	2.94
100-102	1.85	2.74	34.92	0.93	48.29	8.2	40.7	30.5	20.6	4.8	4.38	0.21	1.25	86.5	1587	2.94
102-104	1.91	2.75	30.71	0.83	45.22										1573	3.01
104-106	1.87	2.74	33.36	0.89	47.17											
106-108	1.89	2.80	33.54	0.92	47.84										1584	3.00
108-110	1.88	2.80	34.82	0.95	48.75										1596	2.99
110-112	1.88	2.74	32.94	0.88	46.81	10.2	40.3	29.9	19.5	4.5	4.54	0.18	1.13	83.8	1587	2.98
112-114	1.88	2.78	33.98	0.92	48.01										1586	2.98
114-116	1.89	2.77	32.72	0.89	46.97										1583	3.00
116-118	1.92	2.77	30.99	0.84	45.62											
118-120	1.93	2.78	30.34	0.82	45.18										1592	3.07
120-122	1.92	2.76	30.63	0.83	45.21	19.7	38.0	23.3	19.0	3.5	5.03	0.16	0.92	88.5	1592	3.05
122-124	1.89	2.80	33.63	0.92	47.94										1579	2.99
124-126	1.91	2.78	32.13	0.87	46.59										1591	3.03
126-128	1.91	2.77	31.62	0.85	46.07										1604	3.06
128-130	1.97	2.76	27.55	0.74	42.65											
130-132	1.85	2.75	35.46	0.95	48.76	5.4	42.6	27.2	24.9	5.4	4.52	0.29	1.04	86.1		
MEAN	1.83	2.74	37.15	0.99	49.68	4.4	40.0	36.8	18.8	5.0	3.69	0.31	1.28	89.9	1576	2.93

KW-PE-GC-208

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.79	2.73	40.81	1.09	52.15	0.4	11.6	69.2	18.8	6.4	2.72	0.51	1.25	87.8	1533	2.74
2-4	1.79	2.73	40.76	1.09	52.12										1527	2.73
4-6	1.77	2.73	42.25	1.13	53.01										1524	2.70
6-8	1.78	2.73	41.76	1.11	52.71										1526	2.71
8-10	1.78	2.74	41.06	1.10	52.33										1524	2.72
10-12	1.79	2.74	40.62	1.09	52.09	0.5	11.8	62.6	25.1	6.7	1.58	0.18	1.12	88.3	1521	2.72
12-14	1.75	2.73	43.72	1.17	53.82										1521	2.67
14-16	1.77	2.73	41.78	1.11	52.69										1513	2.68
16-18	1.78	2.73	41.51	1.11	52.56										1515	2.69
18-20	1.78	2.73	41.20	1.10	52.33										1515	2.70
20-22	1.76	2.74	43.85	1.17	53.96	0.3	17.4	58.0	24.3	6.4	3.04	0.50	1.16	88.4	1517	2.66
22-24	1.79	2.74	40.30	1.08	51.86										1515	2.71
24-26	1.79	2.74	41.05	1.10	52.36										1518	2.71
26-28	1.81	2.72	38.57	1.03	50.64										1519	2.74
28-30	1.82	2.73	37.97	1.01	50.34										1522	2.76
30-32	1.81	2.74	39.02	1.05	51.13	0.4	18.9	57.0	23.7	6.4	3.05	0.55	1.13	89.1	1524	2.76
32-34	1.81	2.74	38.65	1.03	50.85										1521	2.75
34-36	1.82	2.74	38.08	1.02	50.50										1524	2.77
36-38	1.85	2.73	35.21	0.94	48.40										1526	2.82
38-40	1.81	2.75	38.63	1.04	50.93										1527	2.77
40-42	1.82	2.75	38.44	1.03	50.77	0.8	20.1	55.2	23.9	6.3	3.12	0.55	1.12	88.8	1524	2.77
42-44	1.84	2.75	36.16	0.97	49.29										1526	2.81
44-46	1.83	2.75	37.41	1.00	50.12										1527	2.79
46-48	1.82	2.75	38.16	1.02	50.58										1530	2.78
48-50	1.82	2.75	38.09	1.02	50.59										1529	2.78
50-52	1.84	2.74	36.57	0.98	49.50	0.3	20.4	55.3	24.1	6.4	3.13	0.54	1.10	89.3	1528	2.81
52-54	1.84	2.75	36.67	0.98	49.62										1533	2.82
54-56	1.84	2.75	36.43	0.98	49.45										1535	2.82
56-58	1.83	2.75	37.35	1.00	50.07										1535	2.81
58-60	1.83	2.75	37.68	1.01	50.33										1532	2.80
60-62	1.84	2.76	36.54	0.98	49.59	1.7	16.5	57.0	27.5	6.4	3.12	0.58	1.10	90.5	1533	2.82
62-64	1.84	2.76	36.50	0.98	49.57										1529	2.82
64-66	1.83	2.76	37.65	1.01	50.33										1533	2.80
66-68	1.80	2.76	39.97	1.08	51.83										1529	2.75
68-70	1.82	2.76	38.08	1.02	50.62										1529	2.79
70-72	1.83	2.76	37.17	1.00	50.01	0.8	18.5	54.6	26.1	6.5	3.19	0.52	1.03	89.5	1526	2.80
72-74	1.82	2.75	38.01	1.02	50.54										1529	2.79
74-76	1.82	2.76	38.56	1.04	50.93										1526	2.77
76-78	1.83	2.75	37.10	1.00	49.92										1526	2.80
78-80	1.85	2.76	36.17	0.97	49.35										1526	2.82
80-82	1.83	2.76	37.22	1.00	50.04									91.5	1525	2.79
82-84	1.83	2.76	37.42	1.01	50.19										1528	2.80

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
84-86	1.82	2.76	38.42	1.04	50.88										1530	2.78
86-88	1.84	2.76	36.90	0.99	49.82											
88-90	1.94	2.77	29.63	0.80	44.48											
90-92	1.50	2.77	83.08		69.20	0.5	21.2	43.5	34.8	6.9	3.52	0.48	0.72	86.3		
92-94	1.58	2.76	67.96	1.83	64.72											
94-96	1.68	2.77	53.10	1.43	58.93											
96-98	1.73	2.77	47.20	1.28	56.08											
98-100	1.70	2.77	51.69	1.40	58.32										1561	2.65
100-102	1.86	2.78	35.42	0.96	49.03	1.2	20.9	38.4	39.5	7.1	3.61	0.43	0.67	88.3	1552	2.89
102-104	1.83	2.77	37.94	1.03	50.64										1549	2.83
104-106	1.82	2.76	38.16	1.03	50.74										1537	2.80
106-108	1.85	2.76	35.49	0.96	48.86										1535	2.84
108-110	1.86	2.75	34.92	0.94	48.43										1547	2.88
110-112	1.85	2.77	36.11	0.98	49.41	0.8	27.5	42.8	28.9	6.6	3.70	0.31	0.87	88.3	1551	2.87
112-114	1.82	2.76	38.83	1.05	51.16										1536	2.79
114-116	1.82	2.76	38.74	1.04	51.10										1530	2.78
116-118	1.83	2.76	37.48	1.01	50.25										1534	2.81
118-120	1.83	2.77	37.76	1.02	50.56										1527	2.80
120-122	1.89	2.78	33.47	0.91	47.61	0.2	22.4	39.9	37.6	7.0	3.60	0.44	0.69	87.8	1531	2.89
122-124	1.91	2.78	31.61	0.86	46.15										1563	2.99
124-126	1.95	2.76	28.23	0.76	43.25										1563	3.05
126-128	1.90	2.78	32.30	0.88	46.72										1564	2.98
128-130	1.93	2.77	30.09	0.81	44.87										1559	3.01
130-132	1.94	2.75	28.82	0.77	43.63	1.9	22.8	35.4	33.8	6.6	3.96	0.36	0.80	87.7	1562	3.03
132-134	1.94	2.76	29.13	0.79	44.00										1575	3.05
134-136	1.91	2.78	31.52	0.85	46.07										1587	3.03
136-138	1.95	2.76	28.25	0.76	43.25										1578	3.08
138-140	1.89	2.78	33.19	0.90	47.41										1575	2.98
140-142	1.91	2.78	31.62	0.86	46.19	2.4	32.6	36.5	28.6	6.2	3.83	0.43	0.94	91.1	1558	2.98
142-144	1.89	2.76	32.75	0.88	46.93										1553	2.94
144-146	1.91														1563	2.98
146-148	1.88	2.77	33.55	0.91	47.55										1561	2.94
148-150	1.90	2.75	31.73	0.85	46.04										1559	2.96
150-152	1.91	2.78	31.80	0.86	46.33	14.9	31.0	30.8	23.3	4.6	4.93	0.11	1.26	88.0	1556	2.97
152-154	1.89	2.77	32.82	0.89	47.06										1554	2.94
154-156	1.89	2.78	32.99	0.89	47.22										1561	2.95
156-158	1.91	2.81	33.02	0.91	47.56										1580	3.01
158-160	1.93	2.81	30.91	0.85	45.85										1573	3.04
160-162	1.91	2.75	30.91	0.83	45.36	16.5	36.9	25.3	21.2	4.1	4.94	0.15	1.09	91.7	1585	3.03
162-164	1.92	2.80	31.68	0.87	46.46										1583	3.04
164-166	1.89	2.78	33.15	0.90	47.38											
166-168	1.92	2.78	30.95	0.84	45.67										1565	3.01
168-170	1.91	2.77	31.49	0.85	45.97										1569	2.99
170-172	1.92	2.77	30.64	0.83	45.32	4.6	34.9	37.4	23.1	5.8	3.90	0.34	1.28	90.9	1578	3.03
172-174	1.93	2.77	29.81	0.81	44.66										1584	3.06

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
174-176	1.92	2.77	30.46	0.82	45.15										1582	3.04
176-178	1.90	2.75	32.03	0.86	46.25										1575	2.98
178-180	1.91	2.75	31.26	0.84	45.67										1564	2.98
180-182	1.91	2.77	31.27	0.85	45.82	5.3	27.9	41.6	25.2	6.1	3.94	0.35	1.27	92.7	1562	2.99
182-184	1.92	2.76	30.96	0.84	45.53										1575	3.02
184-186	1.87	2.75	34.22	0.92	47.86										1570	2.93
186-188	1.94	2.76	29.02	0.78	43.88											
188-190	1.86	2.78	35.36	0.96	48.99											
190-192	1.91	2.76	31.49	0.85	45.91	3.7	30.5	40.8	25.0	6.1	3.83	0.35	1.24	90.6		
192-194	1.88	2.75	32.88	0.88	46.89										1541	2.90
194-196	1.80	2.76	40.08	1.08	51.90										1533	2.76
196-198	1.86	2.75	34.45	0.93	48.09											
198-200	1.91	2.76	31.17	0.84	45.64										1551	2.96
200-202	1.84	2.76	37.02	1.00	49.94	4.3	28.2	43.9	23.5	6.0	3.77	0.35	1.34	90.9	1551	2.85
202-204	1.85	2.81	37.29	1.02	50.53										1548	2.86
204-206	1.85	2.78	36.39	0.99	49.66										1553	2.87
206-208	1.88	2.76	33.52	0.90	47.43										1549	2.91
208-210	1.83	2.75	36.92	0.99	49.82										1557	2.86
210-212	1.82	2.76	38.61	1.04	50.99	0.9	24.6	49.9	24.6	6.3	3.23	0.58	1.05	92.5	1538	2.80
212-214	1.84	2.77	36.70	0.99	49.84										1535	2.83
214-216	1.85	2.80	37.37	1.02	50.58										1543	2.85
216-218	1.88	2.77	33.70	0.91	47.67										1546	2.91
218-220	1.87	2.75	34.02	0.91	47.76										1553	2.90
220-222	1.87	2.75	34.07	0.92	47.78	1.7	36.0	39.9	22.3	5.8	3.41	0.41	1.12	91.4	1549	2.89
222-224	1.89	2.77	32.96	0.89	47.10										1556	2.94
224-226	1.90	2.77	32.34	0.87	46.61										1554	2.95
226-228	1.85	2.74	35.75	0.96	48.93										1551	2.86
228-230	1.86	2.79	36.11	0.98	49.55										1546	2.87
230-232	1.84	2.75	36.42	0.98	49.44	0.3	30.3	46.3	23.1	6.0	3.28	0.46	1.07	91.0	1546	2.84
232-234	1.83	2.77	37.76	1.02	50.53										1544	2.83
234-236	1.85	2.77	36.22	0.98	49.46										1543	2.85
236-238	1.83	2.74	37.08	0.99	49.80										1543	2.82
238-240															1544	2.80
MEAN	1.85	2.76	36.70	0.98	49.39	2.8	24.5	46.1	26.4	6.2	3.50	0.41	1.06	89.7	1544	2.86

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.69	2.71	50.24	1.33	57.08	0.6	22.0	52.7	24.7	6.1	3.45	0.29	1.32	84.8		
2-4	1.68	2.73	52.76	1.41	58.48											
4-6	1.71	2.73	49.27	1.32	56.81											
6-8	1.74	2.72	44.95	1.20	54.46											
8-10	1.72	2.76	47.98	1.29	56.37											
10-12	1.75	2.73	44.76	1.19	54.43	1.8	20.5	55.1	22.6	5.6	3.72	0.24	1.36	87.1		
12-14	1.74	2.74	45.86	1.23	55.10											
14-16	1.67	2.73	53.27	1.42	58.70										1538	2.57
16-18	1.67	2.74	53.64	1.44	58.94										1517	2.54
18-20	1.70	2.74	50.62	1.36	57.55											
20-22	1.70	2.75	50.61	1.36	57.61	1.4	23.6	51.0	24.0	5.9	4	0.28	1.64	86.9	1493	2.54
22-24	1.68	2.75	52.59	1.41	58.53										1538	2.59
24-26	1.75	2.74	44.95	1.20	54.64										1552	2.71
26-28	1.78	2.75	41.73	1.12	52.83										1545	2.75
28-30	1.78	2.75	42.13	1.13	53.08										1546	2.75
30-32	1.80	2.74	39.67	1.06	51.53	1.1	22.5	51.5	24.9	6.0	3.98	0.23	1.25	89.1	1544	2.78
32-34	1.79	2.75	40.89	1.10	52.33										1551	2.78
34-36	1.77	2.74	42.17	1.13	53.05										1556	2.76
36-38	1.78	2.74	41.72	1.12	52.76										1564	2.78
38-40	1.79	2.75	41.01	1.10	52.41										1558	2.79
40-42	1.79	2.76	40.94	1.10	52.44	6.5	33.7	40.4	19.5	4.9	4.12	0.11	1.11	90.1	1557	2.79
42-44	1.80	2.76	40.57	1.09	52.22										1562	2.80
44-46	1.82	2.76	38.56	1.04	50.99										1563	2.84
46-48	1.79	2.75	40.96	1.10	52.42										1564	2.80
48-50	1.81	2.75	39.09	1.05	51.25										1567	2.84
50-52	1.81	2.75	39.36	1.06	51.41	3.2	32.4	44.2	20.2	5.1	4.14	0.2	1.01	91.1	1565	2.83
52-54	1.84	2.76	36.17	0.97	49.33										1569	2.89
54-56	1.82	2.77	38.97	1.05	51.29										1566	2.84
56-58	1.80	2.77	40.46	1.09	52.26										1562	2.81
58-60	1.80	2.76	40.77	1.10	52.39										1558	2.80
60-62	1.79	2.79	41.72	1.14	53.19	4.4	32.8	42.0	20.9	5.0				91.0	1558	2.79
62-64	1.77	2.80	44.17	1.21	54.71										1544	2.73
64-66	1.79	2.80	42.26	1.16	53.61										1553	2.78
66-68	1.79	2.77	41.40	1.12	52.84										1559	2.79
68-70	1.80	2.77	40.16	1.09	52.08										1560	2.82
70-72	1.83	2.77	37.44	1.01	50.31	4.7	33.1	41.0	21.1	5.0	4.18	0.19	0.88	91.6	1559	2.86
72-74	1.83	2.76	37.08	1.00	49.94										1561	2.86
74-76	1.83	2.76	37.66	1.01	50.35										1564	2.86
76-78	1.85	2.75	35.73	0.96	48.98										1560	2.88
78-80	1.83	2.77	37.72	1.02	50.48										1560	2.86
80-82	1.86	2.77	35.41	0.96	48.88	3.5	36.5	38.8	21.3	5.4	3.83	0.29	1.32	90.5	1561	2.90
82-84	1.83	2.76	37.86	1.02	50.54											

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
84-86	1.95	2.77	28.79	0.78	43.76											
86-88	1.99	2.77	25.76	0.70	41.05											
88-90	1.96	2.74	27.42	0.73	42.29											
90-92	1.91	2.82	32.44	0.89	47.15	7.1	34.4	36.2	22.3	5.4	4.05	0.26	1.41	92.1		
92-94	1.92	2.77	30.80	0.83	45.41											
94-96	1.91	2.76	31.11	0.84	45.62											
96-98	1.91	2.76	31.28	0.84	45.78											
98-100	1.92	2.77	30.76	0.83	45.39										1525	2.93
100-102	1.90	2.77	31.92	0.86	46.36	5.3	36.4	36.7	21.5	5.3	4.49	0.13	1.23	92.0	1526	2.91
102-104	1.93	2.74	29.16	0.78	43.85										1521	2.94
104-106	1.90	2.78	32.32	0.88	46.70										1519	2.89
106-108	1.92	2.79	31.36	0.85	46.05										1524	2.92
108-110	1.91	2.79	31.70	0.86	46.31										1521	2.91
110-112	1.92	2.77	30.78	0.83	45.46	15.0	37.3	29.1	18.6	4.2				89.6	1516	2.91
112-114	1.93	2.75	29.89	0.80	44.56										1520	2.93
114-116	1.91	2.76	30.95	0.83	45.49										1521	2.91
116-118	1.89	2.80	34.07	0.93	48.22										1512	2.85
118-120	1.94	2.80	30.31	0.83	45.28										1525	2.95
120-122	1.93	2.78	30.32	0.82	45.19	12.2	33.1	31.6	23.2	5.2	4.58	0.14	1.23	90.5	1523	2.94
122-124	1.92	2.79	31.32	0.85	46.03										1523	2.92
124-126	1.94	2.76	28.95	0.78	43.80										1526	2.96
126-128	1.93	2.78	30.55	0.83	45.33										1524	2.94
128-130	1.94	2.78	29.58	0.80	44.52										1516	2.94
130-132	1.94	2.79	29.99	0.82	44.97	9.9	38.6	32.9	18.6	4.7	4.17	0.22	1.19	90.3	1520	2.95
132-134	1.92	2.77	30.76	0.83	45.39										1512	2.90
134-136	1.94	2.80	30.41	0.83	45.42										1515	2.94
136-138	1.94	2.78	29.37	0.80	44.33										1519	2.95
138-140	1.91	2.83	33.24	0.92	47.89										1506	2.87
140-142	1.89	2.77	32.98	0.89	47.15	13.3	41.3	27.8	17.6	4.2	4.41	0.13	1.27	91.6	1506	2.85
142-144	1.95	2.77	29.03	0.79	44.01										1507	2.93
144-146	1.92	2.79	31.13	0.85	45.92										1512	2.91
146-148	1.84	2.73	35.87	0.96	48.89										1488	2.74
148-150	1.90	2.76	31.74	0.85	46.07										1483	2.82
150-152	1.91	2.78	31.40	0.85	46.01	9.8	39.9	28.4	21.9	4.9	4.37	0.27	1.03	89.3	1517	2.90
152-154	1.95	2.76	28.08	0.76	43.05										1523	2.98
154-156	1.95	2.78	28.78	0.78	43.82										1529	2.98
156-158	1.96	2.77	28.10	0.76	43.21										1533	3.00
158-160	2.00	2.80	26.29	0.72	41.78										1539	3.08
160-162	1.97	2.77	27.40	0.74	42.57	7.6	42.2	28.2	22.0	5.0	4.38	0.29	1.19	91.0	1555	3.06
162-164	1.96	2.80	28.54	0.78	43.84											
164-166	1.97	2.77	27.48	0.74	42.60										1562	3.07
166-168	1.97	2.79	28.10	0.76	43.32										1545	3.04
168-170	1.97	2.76	27.28	0.74	42.37										1541	3.03
170-172	2.00	2.77	25.71	0.70	41.02	10.8	36.1	36.0	17.1	4.6	4	0.13	1.37	89.8	1548	3.09
172-174	1.97	2.80	28.29	0.77	43.62										1542	3.04

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
174-176	1.98	2.76	26.70	0.72	41.84										1546	3.06
176-178	1.95	2.76	28.37	0.77	43.35										1545	3.01
178-180	1.87	2.77	34.58	0.94	48.32											
180-182	1.86	2.77	34.95	0.95	48.60	7.1	44.2	25.4	23.3	5.3	4.2	0.37	1.15	89.9	1545	2.88
182-184	1.87	2.76	34.60	0.93	48.29											
184-186	1.91	2.77	31.66	0.86	46.12										1588	3.03
186-188		2.77													1582	2.62
188-190																
190-192	1.94	2.77	29.37	0.79	44.28	1.4	39.6	22.5	33.5	6.2	3.89	0.45	0.8	90.1	1585	3.08
MEAN	1.86	2.77	35.82	0.97	48.68	6.3	34.0	37.6	21.9	5.2	4.11	0.23	1.21	89.9	1540	2.87

KW-PE-GC-213

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
0-2	1.68	2.74	52.74	1.41	58.49	0.0	13.3	65.9	20.8	6.4	2.82	0.51	1.22	88.4		
2-4	1.65	2.74	56.16	1.50	60.04											
4-6	1.66	2.74	55.64	1.49	59.85											
6-8	1.68	2.74	53.19	1.42	58.75											
8-10	1.73	2.74	46.65	1.25	55.51											
10-12	1.78	2.74	41.25	1.10	52.45	0.1	15.6	60.0	24.4	6.6	3.11	0.56	1.17	88.7		
12-14	1.80	2.74	39.22	1.05	51.21											
14-16	1.80	2.74	39.39	1.05	51.27											
16-18	1.78	2.74	41.21	1.10	52.42											
18-20	1.80	2.73	38.99	1.04	51.00											
20-22	1.79	2.74	40.59	1.08	52.03	0.3	15.1	60.6	23.9	6.5	3.02	0.53	1.18	89.1		
22-24	1.80	2.74	39.69	1.06	51.53										1516	2.73
24-26	1.80	2.74	39.62	1.06	51.51										1524	2.74
26-28	1.80	2.74	39.88	1.07	51.58										1516	2.72
28-30	1.81	2.74	39.05	1.04	51.08										1519	2.74
30-32	1.82	2.74	37.79	1.01	50.24	0.1	20.5	57.1	22.3	6.3				89.1	1518	2.76
32-34	1.79	2.74	40.25	1.08	51.83										1519	2.72
34-36	1.83	2.74	37.23	1.00	49.90										1527	2.79
36-38	1.83	2.74	37.23	1.00	49.93										1531	2.80
38-40	1.81	2.74	39.09	1.05	51.15										1522	2.75
40-42	1.84	2.74	36.16	0.97	49.20	0.7	30.3	50.7	18.3	5.5	3.07	0.37	1.4	90.1	1528	2.81
42-44	1.84	2.74	36.51	0.98	49.44										1521	2.79
44-46	1.82	2.74	37.81	1.01	50.30										1529	2.78
46-48	1.83	2.74	36.80	0.99	49.65										1529	2.80
48-50	1.84	2.75	36.78	0.99	49.69										1529	2.81
50-52	1.83	2.75	37.30	1.00	50.05	0.3	23.5	53.1	23.1	6.3	3.16	0.53	1.13	89.5	1526	2.79
52-54	1.82	2.75	38.40	1.03	50.76										1525	2.77
54-56	1.84	2.75	36.73	0.99	49.64										1529	2.81
56-58	1.84	2.75	36.39	0.98	49.39										1533	2.82
58-60	1.81	2.75	38.72	1.04	50.94										1530	2.77
60-62	1.83	2.75	36.98	0.99	49.83	0.7	28.9	48.9	21.5	6.0	3.24	0.47	1.14	85.4	1529	2.80
62-64	1.83	2.74	37.27	1.00	49.97										1526	2.79
64-66	1.84	2.74	35.88	0.96	48.99										1532	2.82
66-68	1.83	2.75	37.16	1.00	49.90										1526	2.79
68-70	1.82	2.75	38.47	1.03	50.81										1523	2.76
70-72	1.82	2.75	37.70	1.01	50.31	0.5	26.9	48.7	23.9	6.0	3.08	0.47	1.03	89.3	1528	2.79
72-74	1.84	2.76	36.92	0.99	49.85										1529	2.81
74-76	1.85	2.76	35.74	0.96	49.05										1536	2.84
76-78	1.86	2.76	35.25	0.95	48.70										1537	2.85
78-80	1.86	2.75	34.81	0.94	48.34											
80-82	1.91	2.75	30.74	0.83	45.26	1.9	27.4	47.0	23.7	6.1	3.45	0.43	1.12	89.0		
82-84	1.93	2.75	29.79	0.80	44.45											

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.86	2.75	35.04	0.94	48.49											
86-88	1.82	2.75	38.03	1.02	50.57											
88-90	1.88	2.75	33.11	0.89	47.10											
90-92	1.90	2.75	32.07	0.86	46.30	0.7	25.2	50.6	23.4	6.2	3.25	0.53	1.11	89.8		
92-94	1.89	2.76	32.90	0.89	46.97											
94-96	1.90	2.76	31.58	0.85	45.95											
96-98	1.86	2.76	34.84	0.94	48.42											
98-100	1.91	2.76	31.13	0.84	45.61											
100-102	1.92	2.75	30.56	0.82	45.12	0.7	39.9	44.6	21.9	5.9	3.38	0.45	1.17	89.9		
102-104	1.90	2.78	32.85	0.89	47.18											
104-106	1.87	2.76	34.00	0.92	47.85											
106-108	1.89	2.78	32.89	0.89	47.14											
108-110	1.87	2.76	34.06	0.92	47.83											
110-112	1.90	2.77	32.44	0.88	46.74	1.2	31.2	44.1	23.5	6.1	3.55	0.41	1.15	90.0	1527	2.90
112-114	1.93	2.75	29.64	0.80	44.30										1543	2.97
114-116	1.90	2.77	32.10	0.87	46.45										1530	2.91
116-118	1.89	2.75	32.11	0.86	46.31										1529	2.90
118-120	1.89	2.78	33.53	0.91	47.65										1524	2.88
120-122	1.88	2.74	33.13	0.89	46.99	2.2	34.4	41.3	22.2	5.8	3.64	0.37	1.21	89.6	1519	2.85
122-124	1.89	2.74	31.92	0.85	46.09										1521	2.88
124-126	1.88	2.80	34.43	0.94	48.53										1519	2.86
126-128	1.89	2.77	33.20	0.90	47.34										1527	2.88
128-130	1.91	2.75	31.11	0.83	45.50										1521	2.90
130-132	1.81	2.76	39.60	1.07	51.63	2.5	25.6	49.8	22.1	6.0	3.46	0.46	1.28	90.4	1501	2.71
132-134	1.78	2.76	42.24	1.14	53.23										1501	2.67
134-136	1.88	2.76	33.19	0.89	47.19										1518	2.86
136-138	1.88	2.79	34.59	0.94	48.55										1518	2.85
138-140	1.90	2.79	32.57	0.89	47.01										1526	2.90
140-142	1.89	2.76	32.38	0.87	46.61	5.3	35.6	37.2	22.0	5.7	3.88	0.3	1.47	90.1	1530	2.90
142-144	1.91														1522	2.90
144-146	1.90	2.76	31.90	0.86	46.23										1533	2.91
146-148	1.90	2.74	31.75	0.85	45.96										1527	2.89
148-150	1.91	2.76	31.38	0.85	45.86										1518	2.90
150-152	1.92	2.76	30.69	0.83	45.27	2.5	33.6	40.0	23.9	6.2	3.79	0.26	1.23		1527	2.93
152-154	1.91	2.78	31.62	0.86	46.16											
154-156	1.93	2.78	30.73	0.84	45.52										1530	2.95
156-158	1.89	2.75	32.44	0.87	46.52										1521	2.87
158-160	1.89	2.78	33.15	0.90	47.32										1524	2.88
160-162	1.91	2.79	32.35	0.88	46.85	6.5	37.5	33.6	22.4	5.6	4.07	0.27	1.28		1532	2.92
162-164	1.92	2.76	30.66	0.83	45.22										1529	2.93
164-166	1.96	2.76	27.80	0.75	42.82										1523	2.98
166-168	1.97	2.76	27.09	0.73	42.19										1541	3.03
168-170	1.94	2.77	29.29	0.79	44.19										1540	2.99
170-172	1.94	2.78	29.37	0.80	44.36	5.2	42.4	32.1	20.4	5.2	3.96	0.32	1.44		1542	3.00
172-174	1.96	2.75	27.74	0.74	42.68										1548	3.03

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
174-176	1.95	2.76	28.45	0.77	43.43											
176-178	2.04	2.77	23.08	0.62	38.42											
178-180	1.93	2.76	29.51	0.80	44.31										1556	3.04
180-182	1.96	2.78	28.61	0.78	43.72	9.6	46.0	26.3	18.2	4.3	4.3	0.25	1.57			
182-184	1.91	2.77	31.36	0.85	45.94										1546	2.98
184-186	1.93	2.79	30.73	0.84	45.61										1538	2.98
186-188	1.93	2.78	30.10	0.82	45.01										1544	3.02
188-190	1.95	2.78	28.82	0.78	43.93										1541	2.99
190-192	1.94	2.77	29.32	0.79	44.24	6.2	44.3	28.5	21.1	5.1	4.16	0.32	1.42		1530	2.92
192-194	1.91	2.76	31.47	0.85	45.90										1533	2.95
194-196	1.93	2.77	30.27	0.82	45.03										1530	2.97
196-198	1.94	2.77	29.42	0.80	44.29										1551	3.01
198-200	1.94	2.77	29.18	0.79	44.13										1532	2.91
200-202	1.90	2.79	32.76	0.89	47.17	3.3	40.5	30.0	26.2	5.9	4.04	0.38	1.02		1532	2.89
202-204	1.88	2.77	33.32	0.90	47.37										1550	3.00
204-206	1.93	2.76	29.59	0.80	44.38										1540	2.96
206-208	1.92	2.79	31.40	0.86	46.12										1537	2.97
208-210	1.93	2.77	29.73	0.80	44.57										1536	2.95
210-212	1.92	2.77	30.57	0.83	45.26	2.3	34.8	34.0	28.9	6.0	4.18	0.32	0.87		1531	2.89
212-214	1.88	2.77	33.22	0.90	47.29										1542	3.00
214-216	1.94	2.77	29.14	0.79	44.11										1551	3.01
216-218	1.94	2.77	29.48	0.80	44.36										1543	2.99
218-220	1.94	2.78	29.46	0.80	44.41										1535	2.95
220-222	1.92	2.77	30.45	0.82	45.17	2.4	34.0	32.5	31.1	6.3	4.09	0.36	0.85		1543	2.96
222-224	1.92	2.77	30.87	0.84	45.52										1535	3.00
224-226	1.96	2.76	27.99	0.75	43.02										1542	2.95
226-228	1.92	2.76	30.82	0.83	45.39										1550	3.02
228-230	1.95	2.77	28.55	0.77	43.58										1548	3.02
230-232	1.95	2.78	28.69	0.78	43.78	1.7	28.1	37.5	32.7	6.6	3.83	0.41	0.79		1543	2.99
232-234	1.93	2.75	29.32	0.79	44.08										1539	2.99
234-236	1.94	2.76	28.75	0.77	43.65										1539	3.01
236-238	1.96	2.76	27.82	0.75	42.81											
MEAN	1.88	2.76	34.19	0.92	47.66	2.4	30.6	43.9	23.4	5.9	3.59	0.40	1.18	89.2	1531	2.89

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.54	2.74	75.20		66.76	0.1	23.3	57.0	20.6	6.3	3.25	0.39	1.3		
2-4	1.74	2.75	45.56	1.22	55.00										
4-6	1.78	2.74	41.49	1.11	52.62										
6-8	1.78	2.74	41.27	1.11	52.51										
8-10	1.75	2.75	44.48	1.19	54.40										
10-12	1.86	2.75	35.04	0.94	48.45	0.5	29.3	50.1	20.1	5.9	3.41	0.34	1.4		
12-14	1.82	2.74	37.53	1.00	50.12										
14-16	1.84	2.74	36.54	0.98	49.45									1491	2.74
16-18	1.85	2.74	35.30	0.94	48.57									1504	2.78
18-20	1.85	2.73	34.81	0.93	48.16									1509	2.80
20-22	1.84	2.74	36.15	0.97	49.17	1.3	35.0	43.8	19.9	5.5	3.49	0.29	1.26	1507	2.77
22-24	1.87	2.75	33.54	0.90	47.35									1509	2.83
24-26	1.86	2.75	34.37	0.92	47.97									1507	2.81
26-28	1.88	2.74	32.94	0.88	46.88									1511	2.84
28-30	1.87	2.75	33.90	0.91	47.63									1510	2.82
30-32	1.89	2.75	32.23	0.87	46.41	1.6	40.7	39.9	17.8	5.1	3.39	0.31	1.22	1516	2.87
32-34	1.88	2.75	33.61	0.90	47.49									1510	2.83
34-36	1.89	2.75	32.56	0.87	46.61									1515	2.86
36-38	1.89	2.74	31.96	0.86	46.13									1527	2.89
38-40	1.92	2.75	30.18	0.81	44.78									1531	2.94
40-42	1.91	2.75	30.63	0.82	45.14	3.3	44.5	36.1	16.1	4.7	3.49	0.25	1.23	1532	2.93
42-44	1.91	2.76	31.02	0.84	45.51									1531	2.93
44-46	1.86	2.76	34.79	0.94	48.36									1519	2.83
46-48	1.89	2.76	32.52	0.88	46.67									1522	2.88
48-50	1.89	2.76	32.49	0.88	46.70									1524	2.89
50-52	1.90	2.76	32.15	0.87	46.42	2.6	39.5	36.8	21.2	5.6	3.95	0.31	1.16	1525	2.89
52-54	1.89	2.76	32.98	0.89	47.07									1525	2.88
54-56	1.89	2.76	32.81	0.88	46.95									1520	2.87
56-58	1.88	2.77	33.29	0.90	47.34									1509	2.84
58-60	1.89	2.76	32.99	0.89	47.06									1523	2.87
60-62	1.89	2.76	32.43	0.87	46.66	1.6	40.2	38.4	19.8	5.3	3.55	0.3	0.94	1527	2.89
62-64	1.88	2.76	33.82	0.91	47.73									1525	2.86
64-66	1.87	2.77	34.62	0.93	48.32									1508	2.82
66-68	1.91	2.76	31.02	0.84	45.57									1520	2.91
68-70	1.90	2.77	31.84	0.86	46.25									1523	2.90
70-72	1.88	2.77	33.28	0.90	47.35	0.8	36.8	41.2	21.2	5.8				1521	2.87
72-74	1.92	2.77	31.06	0.84	45.66									1526	2.92
74-76	1.91	2.79	32.04	0.87	46.58									1528	2.92
76-78	1.90	2.77	32.12	0.87	46.52									1524	2.90
78-80	1.92	2.76	30.62	0.83	45.25									1529	2.94
80-82	2.00	2.76	25.59	0.69	40.84	3.0	49.0	30.3	17.7	4.7	3.59	0.41	1.15	1548	3.09
82-84	1.95	2.77	28.70	0.78	43.73									1535	2.99

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.94	2.77	29.77	0.81	44.64									1530	2.96
86-88	1.95	2.77	28.59	0.77	43.61									1529	2.98
88-90	1.94	2.80	30.45	0.83	45.42									1533	2.97
90-92	1.97	2.78	28.02	0.76	43.22	9.5	44.8	27.0	18.7	4.5	4.25	0.28	1.23	1543	3.03
92-94	1.90	2.75	31.97	0.86	46.20										
94-96	1.92	2.75	30.16	0.81	44.79										
96-98	1.92	2.75	30.07	0.81	44.71										
98-100	1.88	2.77	33.77	0.91	47.71										
100-102	1.94	2.77	29.43	0.80	44.31	9.4	46.7	23.9	20.0	4.5	4.37	0.36	1.17	1546	3.00
102-104	1.92	2.78	30.77	0.84	45.53										
104-106	1.95	2.81	29.96	0.82	45.11									1543	3.00
106-108	1.96	2.77	27.87	0.75	42.99									1546	3.03
108-110	1.92	2.78	30.57	0.83	45.32									1533	2.95
110-112	1.91	2.77	31.28	0.85	45.84	6.2	46.7	27.0	20.1	4.7	4.19	0.34	1.16	1530	2.93
112-114	1.90	2.77	32.07	0.87	46.42									1535	2.92
114-116	1.90	2.76	32.24	0.87	46.50									1532	2.91
116-118	1.91	2.80	32.63	0.89	47.17									1541	2.94
118-120	1.89	2.78	33.60	0.91	47.74									1531	2.89
120-122	1.94	2.77	29.27	0.79	44.19	9.4	44.2	26.4	20.0	4.5	4.47	0.27	1.18	1541	2.99
122-124	1.94	2.79	29.73	0.81	44.74									1545	3.00
124-126	1.95	2.79	29.66	0.81	44.73									1536	2.99
126-128	1.95	2.80	29.53	0.81	44.70									1544	3.01
128-130	1.94	2.79	30.18	0.82	45.13									1526	2.95
130-132	1.95	2.77	28.49	0.77	43.53	3.6	41.6	30.4	24.4	5.4	4.23	0.24	0.97	1550	3.03
132-134	1.96	2.78	28.32	0.77	43.42									1560	3.05
134-136	1.98	2.78	27.01	0.73	42.30									1563	3.09
136-138	1.96	2.79	28.59	0.78	43.79									1551	3.04
138-140	1.98	2.78	26.90	0.73	42.22									1556	3.08
140-142	1.94	2.78	29.42	0.80	44.40	1.1	35.1	34.1	29.7	6.2	4.03	0.33	0.8	1549	3.01
142-144	1.97	2.78	27.45	0.75	42.73									1551	3.06
144-146	1.98	2.81	27.40	0.75	42.88									1564	3.10
146-148	1.99	2.79	26.52	0.72	41.93									1556	3.10
148-150	1.99	2.77	26.21	0.71	41.51									1557	3.10
150-152	1.95	2.78	29.26	0.79	44.27	3.0	43.3	27.4	26.3	5.6	4.27	0.3	0.92	1568	3.05
MEAN	1.90	2.77	32.48	0.86	46.42	3.6	40.0	35.6	20.8	5.3	3.86	0.31	1.14	1531	2.93

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.55	2.66	70.03	1.82	64.48	0.1	20.9	57.9	21.1	6.0	2.87	0.42	1.51	1506	2.20
2-4	1.58	2.68	65.00	1.70	63.00									1516	2.34
(2-4)A	1.66	2.73	58.62	1.60	61.54										
(2-4)B	1.67	2.72	56.26	1.53	60.48										
(2-4)C	1.67	2.71	57.27	1.55	60.82										
(2-4)D	1.67	2.70	56.48	1.53	60.40										
(2-4)E	1.66	2.70	57.73	1.56	60.92										
(2-4)F	1.66	2.69	58.08	1.56	60.97										
(2-4)G	1.66	2.69	56.85	1.53	60.46										
4-6	1.61	2.70	60.34	1.59	61.37									1525	2.41
6-8	1.69	2.69	49.61	1.30	56.56									1524	2.46
8-10	1.73	2.70	45.31	1.19	54.42									1530	2.58
10-12	1.73	2.69	44.89	1.18	54.14	0.3	22.0	56.9	20.3	5.9	2.83	0.43	1.45	1541	2.67
12-14	1.76	2.71	42.26	1.12	52.78									1545	2.68
(12-14)A	1.75	2.73	47.64	1.30	56.53										
(12-14)B	1.77	2.72	44.25	1.20	54.62										
(12-14)C	1.73	2.73	50.87	1.39	58.14										
(12-14)D	1.72	2.72	50.78	1.38	58.00										
(12-14)E	1.74	2.72	48.66	1.32	56.96										
(12-14)F	1.76	2.72	45.99	1.25	55.57										
(12-14)G	1.79	2.72	42.66	1.16	53.71										
(12-14)H	1.78	2.72	41.87	1.14	53.24										
(12-14)I	1.77	2.71	44.48	1.21	54.66										
(12-14)J	1.74	2.70	46.44	1.25	55.63										
(12-14)K	1.74	2.70	48.13	1.30	56.51										
14-16	1.77	2.68	41.01	1.08	51.81									1544	2.72
16-18	1.77	2.70	40.97	1.08	51.95									1545	2.73
18-20	1.78	2.72	40.95	1.09	52.10									1540	2.73
(18-20)A	1.77	2.75	45.86	1.26	55.78										
(18-20)B	1.76	2.74	46.90	1.28	56.23										
(18-20)C	1.73	2.74	42.64	1.17	53.88										
(18-20)D	1.78	2.74	44.59	1.22	54.99										
(18-20)E	1.79	2.74	42.64	1.17	53.88										
(18-20)F	1.76	2.74	46.60	1.28	56.08										
(18-20)G	1.78	2.73	43.31	1.18	54.18										
(18-20)H	1.78	2.72	43.60	1.19	54.25										
(18-20)I	1.80	2.73	41.52	1.13	53.13										
(18-20)J	1.78	2.73	43.28	1.18	54.16										
(18-20)K	1.76	2.73	44.37	1.21	54.78										
20-22	1.75	2.72	43.88	1.16	53.80	0.4	26.4	52.5	20.7	5.7	3.09	0.34	1.18	1539	2.74
22-24	1.74	2.72	45.23	1.20	54.58									1541	2.70
24-26	1.79	2.73	40.52	1.08	51.89									1533	2.66

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
26-28	1.76	2.72	42.96	1.14	53.31									1529	2.73
28-30	1.79	2.72	39.95	1.06	51.48									1532	2.70
30-32	1.80	2.72	39.19	1.04	50.98	1.0	32.2	48.7	18.2	5.4	3.14	0.31	1.30	1533	2.74
32-34	1.80	2.71	38.97	1.03	50.78									1534	2.76
34-36	1.83	2.72	36.88	0.98	49.53									1533	2.76
36-38	1.80	2.72	38.62	1.03	50.66									1537	2.81
38-40	1.86	2.73	34.39	0.92	47.79									1533	2.77
40-42	1.87	2.73	33.15	0.88	46.92	2.4	36.7	44.4	16.8	5.1	3.21	0.24	1.33	1542	2.86
42-44	1.84	2.73	35.84	0.95	48.84									1546	2.90
44-46	1.81	2.73	38.63	1.03	50.71									1544	2.84
46-48	1.82	2.72	36.67	0.97	49.31									1539	2.78
48-50	1.84	2.72	35.85	0.95	48.80									1538	2.81
(48-50)A	1.85	2.74	39.03	1.07	51.68										
(48-50)B	1.91	2.75	34.01	0.94	48.32										
(48-50)C	1.84	2.75	38.94	1.07	51.71										
(48-50)D	1.87	2.76	35.77	0.99	49.68										
(48-50)E	1.84	2.75	39.27	1.08	51.92										
(48-50)F	1.92	2.74	32.04	0.88	46.75										
(48-50)G	1.84	2.74	38.20	1.05	51.14										
(48-50)H	1.83	2.74	40.37	1.11	52.52										
(48-50)I	1.87	2.74	36.26	0.99	49.84										
(48-50)J	1.85	2.74	36.64	1.00	50.10										
(48-50)K	1.88	2.74	36.58	1.00	50.06										
(48-50)L	1.88	2.74	35.75	0.98	49.49										
50-52	1.89	2.73	31.47	0.84	45.60	4.0	33.7	43.2	19.1	5.4	3.44	0.26	1.41	1535	2.82
52-54	1.87	2.73	32.91	0.88	46.72									1547	2.93
54-56	1.84	2.72	35.52	0.95	48.59									1542	2.89
56-58	1.83	2.73	36.27	0.97	49.15										
58-60	1.84	2.73	35.63	0.95	48.70									1552	2.85
60-62	1.85	2.72	35.15	0.93	48.32	3.0	35.0	42.5	19.5	5.4	3.43	0.25	1.33	1548	2.85
62-64	1.82	2.71	36.98	0.98	49.50									1550	2.86
64-66	1.80	2.73	39.60	1.06	51.36									1549	2.82
66-68	1.82	2.73	37.84	1.01	50.23									1539	2.77
68-70	1.86	2.72	34.22	0.91	47.61									1541	2.80
70-72	1.84	2.73	35.91	0.96	48.89	4.6	42.2	37.6	15.6	4.6	3.58	0.18	1.35	1544	2.86
72-74	1.88	2.73	32.38	0.86	46.36									1547	2.84
74-76	1.85	2.73	34.69	0.92	48.05									1550	2.92
76-78	1.87	2.73	33.25	0.89	46.96									1553	2.88
78-80	1.85	2.74	35.28	0.94	48.53									1552	2.90
80-82	1.87	2.74	33.75	0.90	47.43	4.6	36.0	39.5	20.0	5.4	3.76	0.24	1.40	1555	2.88
82-84	1.92	2.73	29.79	0.79	44.23									1556	2.91
84-86	1.84	2.74	36.23	0.97	49.23									1561	2.99
86-88	1.97	2.76	26.97	0.73	42.07									1568	2.88
88-90	1.96	2.73	31.34	0.84	45.53										
90-92	1.90	2.73	26.83	0.72	41.73	3.4	41.2	37.1	18.2	5.0	3.65	0.22	1.35		

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
92-94	1.96	2.73	28.18	0.75	42.92										
94-96	1.94	2.73	29.89	0.80	44.37										
96-98	1.92	2.74	28.49	0.76	43.28										
98-100	1.94	2.73	27.82	0.74	42.59										
(98-100)A	1.87	2.79	36.79	1.03	50.65										
(98-100)B	1.86	2.74	37.07	1.02	50.39										
(98-100)C	1.86	2.74	37.15	1.02	50.44										
(98-100)D	1.88	2.74	36.16	0.99	49.77										
(98-100)E	1.85	2.76	36.64	1.01	50.28										
(98-100)F	1.85	2.77	37.18	1.03	50.72										
(98-100)G	1.86	2.75	38.56	1.06	51.44										
(98-100)H	1.87	2.75	38.19	1.05	51.19										
(98-100)I	1.85	2.75	38.52	1.06	51.39										
(98-100)J	1.88	2.75	36.42	1.00	50.07										
(98-100)K	1.87	2.75	36.34	1.00	50.01										
(98-100)L	1.88	2.76	35.62	0.98	49.53										
(98-100)M	1.88	2.74	35.46	0.97	49.29										
100-102	1.95	2.73	29.54	0.79	44.07	5.9	40.6	35.4	18.1	4.8	3.92	0.19	1.32		
102-104	1.92	2.75	26.79	0.72	41.86										
104-106	1.97	2.74	30.12	0.81	44.66										
106-108	1.92	2.78	28.71	0.78	43.82										
108-110	1.95	2.77	28.78	0.78	43.79										
110-112	1.95	2.74	28.23	0.76	43.03	4.7	41.2	31.5	22.5	5.3	3.41	0.23	1.94		
112-114	1.94	2.76	26.88	0.72	41.96										
114-116	1.97	2.79	27.88	0.76	43.18										
116-118	1.97	2.76	29.12	0.79	43.98										
118-120	1.94	2.81	27.99	0.77	43.43										
120-122	1.98	2.74	28.17	0.75	42.98	4.5	42.7	38.2	14.7	4.5					
122-124	1.95	2.77	24.96	0.68	40.33										
124-126	2.01	2.82	28.30	0.78	43.79										
126-128	1.98	2.77	27.05	0.73	42.27										
128-130	1.98	2.78	24.70	0.67	40.14										
130-132	2.02	2.76	25.76	0.69	40.98	12.5	51.7	24.0	11.8	3.1	3.85	0.11	1.29		
132-134	1.99	2.79	26.46	0.72	41.92										
134-136	1.99	2.78	25.19	0.68	40.61										
136-138	2.01	2.81	26.58	0.73	42.14										
138-140	2.00	2.78	26.25	0.71	41.63										
140-142	1.99	2.75	24.46	0.66	39.64	7.4	49.2	27.0	16.4	4.0	4.02	0.25	1.21		
142-144	2.01	2.81	26.90	0.74	42.43										
144-146	1.99	2.77	26.88	0.73	42.10										
146-148	1.98	2.79	25.02	0.68	40.50										
148-150	2.02	2.77	27.72	0.75	42.88										
(148-150)A	1.89	2.78	35.09	0.98	49.38										
(148-150)B	1.88	2.77	34.49	0.96	48.86										
(148-150)C	1.89	2.76	33.29	0.92	47.89										

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
(148-150)D	1.93	2.77	32.98	0.91	47.74										
(148-150)E	1.90	2.77	33.92	0.94	48.44										
(148-150)F	1.87	2.77	35.27	0.98	49.42										
(148-150)G	1.88	2.76	35.85	0.99	49.74										
(148-150)H	1.89	2.75	35.01	0.96	49.06										
(148-150)I	1.91	2.76	33.15	0.91	47.78										
(148-150)J	1.89	2.75	33.40	0.92	47.88										
(148-150)K	1.93	2.78	32.90	0.91	47.77										
(148-150)L	1.93	2.77	30.93	0.86	46.14										
(148-150)M	1.91	2.77	32.35	0.90	47.26										
150-152	1.97	2.74	26.47	0.71	41.46	15.8	41.8	27.5	14.7	3.4	4.33	0.10	1.13		
152-154	1.97	2.76	26.92	0.72	42.01										
154-156	1.97	2.76	27.53	0.74	42.60										
156-158	1.96	2.77	28.06	0.76	43.14										
158-160	1.96	2.77	26.88	0.73	42.11										
160-162	1.98	2.75	27.33	0.73	42.33	9.8	39.5	33.6	17.1	4.5	4.12	0.16	1.36		
162-164	1.96	2.75	25.77	0.69	40.94										
164-166	1.99	2.77	26.70	0.72	41.95										
166-168	1.98	2.75	27.30	0.73	42.33										
168-170	1.96	2.80	26.34	0.72	41.88										
170-172	2.00	2.75	26.72	0.72	41.78	3.6	41.8	32.1	22.5	5.4	4.07	0.33	1.29		
172-174	1.97	2.76	26.53	0.71	41.66										
174-176	1.98	2.79	25.60	0.70	41.12										
176-178	2.01	2.77	24.86	0.67	40.19										
178-180	2.01	2.82	28.17	0.78	43.72										
180-182	1.98	2.76	28.54	0.77	43.48	3.5	40.6	29.8	26.1	5.8	4.22	0.25	0.77	1523	3.06
182-184	1.95	2.77	30.47	0.82	45.16									1522	3.01
184-186	2.05	2.77	33.71	0.91	47.68									1527	2.97
186-188	2.09	2.77	35.04	0.95	48.67										
188-190	1.92	2.76	33.42	0.90	47.40									1532	3.21
190-192	1.88	2.76	30.26	0.82	44.92	2.7	36.5	23.6	37.2	6.6	4.17	0.38	0.97		
192-194	1.86	2.79	30.08	0.82	45.08									1529	2.87
194-196	1.88	2.77	29.29	0.79	44.21									1528	2.85
196-198	1.92	2.81	31.93	0.87	46.65										
198-200	1.94	2.77	31.91	0.86	46.34									1541	2.96
200-202	1.94	2.77	30.28	0.82	45.03	2.7	33.7	33.5	30.1	6.3	4.00	0.32	0.89		
202-204	1.92	2.77	31.76	0.86	46.21									1569	3.05
204-206	1.90	2.79	34.46	0.94	48.44									1564	3.00
206-208	1.93	2.74	32.78	0.88	46.69									1562	2.98
208-210	1.91	2.77	33.41	0.90	47.49									1566	3.02
210-212	1.88	2.75	37.45	1.01	50.14	6.9	30.6	26.9	35.9	6.7	4.53	0.12	0.91	1562	2.98
212-214	1.88	2.75	35.15	0.95	48.59									1562	2.94
214-216	1.88	2.80	35.90	0.98	49.51									1548	2.91
216-218	1.83	2.76	33.79	0.91	47.64									1543	2.91
218-220	1.86	2.72	38.46	1.02	50.56									1544	2.82

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
220-222	1.86	2.74	44.09	1.18	54.13	1.7	20.7	37.4	40.3	7.4	3.97	0.16	0.78	1526	2.83
222-224	1.87	2.74	43.86	1.17	54.02									1527	2.84
224-226	1.81	2.80	43.30	1.18	54.18									1535	2.88
226-228	1.75	2.75	42.60	1.14	53.33									1543	2.79
228-230	1.76	2.75	42.41	1.14	53.26										
230-232	1.78	2.75	74.32	2.00	66.62	2.1	27.1	30.0	40.9	6.9	4.10	0.29	0.80		
232-234	1.77	2.76	44.52	1.20	54.54										
234-236	1.77														
MEAN	1.86	2.75	36.63	0.99	49.09	4.5	36.0	37.1	22.4	5.4	3.73	0.25	1.23	1541	2.82

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.71	2.70	47.16	1.24	55.39	0.0	11.1	67.5	21.4	6.4	2.67	0.54	1.29	90.6		
2-4	1.71	2.70	48.09	1.27	55.88											
4-6	1.76	2.73	42.95	1.15	53.42											
6-8	1.74	2.69	44.37	1.17	53.83											
8-10	1.75	2.73	44.33	1.18	54.19											
10-12	1.77	2.73	42.10	1.12	52.90	0.2	13.1	64.5	22.2	6.4	2.8	0.53	1.63	91.8		
12-14	1.76	2.71	42.98	1.14	53.23											
14-16	1.78	2.71	40.70	1.08	51.82											
16-18	1.82	2.70	36.21	0.96	48.86											
18-20	1.81	2.69	36.92	0.97	49.28											
20-22	1.83	2.72	35.97	0.96	48.86	0.7	14.5	61.4	23.4	6.4				93.1		
22-24	1.81	2.71	37.39	0.99	49.70											
24-26	1.77	2.76	43.37	1.17	53.89											
26-28	1.76	2.74	43.31	1.16	53.67											
28-30	1.79	2.75	40.82	1.10	52.31											
30-32	1.83	2.72	36.57	0.97	49.23	1.9	19.7	57.4	21.0	6.0	3.15	0.48	1.2	92.2		
32-34	1.86	2.79	36.11	0.98	49.57											
34-36	1.91	2.70	29.53	0.78	43.80											
36-38	1.87	2.69	32.10	0.84	45.77											
38-40	1.89	2.75	32.18	0.86	46.33											
40-42	1.91	2.77	31.33	0.85	45.87	0.9	22.7	54.7	21.7	6.0	3.19	0.44	1.12	92.1		
42-44	1.87	2.80	35.12	0.96	49.01											
44-46	1.9	2.75	32.00	0.86	46.22											
46-48	1.89	2.74	32.00	0.86	46.13											
48-50	1.89	2.77	32.73	0.88	46.94											
50-52	1.9	2.70	30.39	0.80	44.45	1.1	16.9	57.0	25.0	6.5				92.7		
52-54	1.91	2.73	30.46	0.81	44.85											
54-56	1.9	2.70	30.12	0.79	44.26											
56-58	1.9	2.81	33.12	0.91	47.57											
58-60	1.89	2.73	31.72	0.85	45.85											
60-62	1.89	2.79	33.20	0.90	47.48	1.0	19.9	43.9	35.2	6.3				92.5		
62-64	1.89	2.77	32.48	0.88	46.74											
64-66	1.9	2.71	30.57	0.81	44.76											
66-68	1.9	2.71	30.70	0.81	44.84											
68-70	1.88	2.71	32.35	0.86	46.16											
70-72	1.9	2.74	31.03	0.83	45.33	1.0	21.5	53.7	23.8	6.3	3.32	0.48	1.19	93.5		
72-74	1.89	2.71	31.17	0.82	45.18											
74-76	1.92	2.71	28.99	0.77	43.39											
76-78	1.9	2.73	30.81	0.82	45.09											
78-80	1.9	2.72	31.15	0.83	45.29											
80-82	1.9	2.73	31.53	0.84	45.70	1.2	21.4	52.4	25.0	6.4	3.43	0.47	1.18	93.5		
82-84	1.91	2.72	29.66	0.79	44.02											

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.92	2.78	30.98	0.84	45.65											
86-88	1.89	2.70	30.84	0.81	44.89											
88-90	1.91	2.75	30.64	0.82	45.16											
90-92	2	2.73	24.71	0.66	39.73	5.1	27.5	45.6	21.7	5.8	3.77	0.29	1.61	91.1		
92-94	1.89	2.76	32.90	0.89	47.03											
94-96	1.86	2.72	34.07	0.90	47.46											
96-98	1.89	2.75	32.78	0.88	46.83											
98-100	1.87	2.72	32.97	0.88	46.73											
100-102	1.89	2.73	31.85	0.85	45.89	1.4	27.6	47.5	23.6	6.0	3.53	0.4	1.2	92.7		
102-104	1.89	2.74	31.80	0.85	45.99											
104-106	1.89	2.77	32.76	0.89	47.00											
106-108	1.89	2.74	32.02	0.86	46.09											
108-110	1.88	2.76	33.55	0.90	47.49											
110-112	1.9	2.73	31.25	0.83	45.42	2.0	23.6	48.0	26.4	6.4	3.62	0.38	1.06	92.2		
112-114	1.87	2.79	35.08	0.95	48.82											
114-116	1.86	2.77	35.24	0.95	48.80											
116-118	1.9	2.75	31.69	0.85	46.00											
118-120	1.89	2.79	33.03	0.90	47.32											
120-122	1.88	2.73	32.82	0.87	46.63	5.1	28.3	37.5	29.1	6.4	4.26	0.28	0.92	96.3		
122-124	1.88	2.74	32.67	0.87	46.61											
124-126	1.89	2.79	33.12	0.90	47.41											
126-128	1.91	2.75	31.27	0.84	45.67										1506	2.87
128-130	1.89	2.75	32.50	0.87	46.63										1509	2.85
130-132	1.94	2.73	28.46	0.76	43.14	3.4	29.3	36.5	30.8	6.1	3.92	0.32	1.07	93.4	1524	2.95
132-134	1.92	2.76	30.56	0.82	45.12										1518	2.91
134-136	1.93	2.78	30.28	0.82	45.11										1526	2.95
136-138	1.9	2.78	32.82	0.89	47.11										1520	2.88
138-140	1.92	2.79	31.44	0.86	46.16										1510	2.90
140-142	1.91	2.79	31.82	0.87	46.46	6.8	34.8	37.6	20.8	5.4	4.02	0.24	1.45	89.8	1513	2.90
142-144	1.91	2.77	31.32	0.85	45.85										1518	2.90
144-146	1.91	2.77	31.30	0.85	45.86										1516	2.90
146-148	1.9	2.79	32.58	0.89	47.06										1518	2.89
148-150	1.91	2.79	32.05	0.87	46.65										1524	2.91
150-152	1.87	2.79	34.82	0.95	48.67	8.8	36.5	35.4	19.4	4.8	4.3	0.17	1.53	93.2	1515	2.84
152-154	1.89	2.77	32.71	0.88	46.91										1511	2.86
154-156	1.91	2.79	32.12	0.87	46.66										1506	2.87
156-158	1.95	2.76	28.56	0.77	43.50										1505	2.93
158-160	1.96	2.78	28.53	0.77	43.65										1530	2.99
160-162	1.95	2.78	29.17	0.79	44.17	13.0	30.1	33.4	23.5	4.9	4.89	0.13	1.22	0.6	1528	2.97
162-164	1.93	2.80	30.91	0.84	45.77										1538	2.97
164-166	1.92	2.78	30.87	0.84	45.60										1535	2.95
166-168	1.92	2.80	31.60	0.86	46.33										1526	2.93
168-170	1.93	2.81	30.93	0.85	45.87										1379	2.66
170-172	1.91	2.74	30.92	0.83	45.30	10.5	27.4	39.0	23.2	5.4	4.39	0.17	1.33	95.1	1542	2.94
172-174	1.96	2.78	28.40	0.77	43.57										1526	2.99

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
174-176	1.9														1529	2.90
176-178	1.93	2.75	29.74	0.80	44.44										1535	2.96
178-180	1.94	2.78	29.95	0.81	44.84										1515	2.93
180-182	1.97	2.74	26.62	0.71	41.60	2.6	35.2	34.6	27.7	6.0	3.98	0.4	0.97	90.1	1530	3.01
182-184	1.97	2.80	28.23	0.77	43.52										1537	3.02
184-186	1.91	2.80	32.25	0.88	46.82										1544	2.95
186-188	2.01														1545	3.10
188-190	2.04	2.80	24.03	0.66	39.63											
190-192	1.91	2.79	32.03	0.87	46.58	1.7	33.8	39.2	25.3	6.1	3.77	0.36	1.02	90.5	1513	2.89
192-194	1.85															
194-196	1.92	2.76	30.72	0.83	45.28											
196-198	1.88	2.81	34.80	0.96	48.86											
198-200	1.84	2.76	36.17	0.97	49.33										1555	2.87
200-202	1.87	2.78	34.98	0.95	48.69	1.9	27.1	37.7	33.3	6.6	3.96	0.38	0.82	90.9	1545	2.88
202-204	1.88	2.81	35.06	0.96	49.07										1548	2.91
204-206	1.89	2.82	34.27	0.94	48.54										1548	2.93
206-208	1.86	2.82	36.91	1.02	50.41										1532	2.85
208-210	1.86	2.79	36.16	0.99	49.65										1531	2.84
210-212	1.87	2.77	34.49	0.93	48.26	0.8	21.2	40.7	37.3	1.0	3.65	0.41	0.71	88.7	1524	2.85
212-214	1.88	2.78	33.51	0.91	47.59										1524	2.87
214-216	1.92	2.83	32.46	0.90	47.29										1528	2.93
216-218	1.92	2.75	30.05	0.81	44.66										1536	2.95
218-220	1.87	2.76	33.99	0.92	47.83										1542	2.89
220-222	1.85	2.77	36.08	0.97	49.35	2.2	23.8	37.3	36.6	6.8	3.97	0.33	0.79	86.6	1548	2.86
222-224	1.84	2.77	36.73	0.99	49.85										1521	2.80
224-226	1.81	2.83	41.65	1.15	53.47										1516	2.74
226-228	1.84	2.75	36.21	0.97	49.32										1516	2.79
228-230	1.83	2.75	36.87	0.99	49.77										1506	2.76
230-232	1.86	2.73	33.92	0.90	47.45	0.4	20.2	41.0	38.4	7.1	3.56	0.44	0.67	88.7	1503	2.80
232-234	1.81	2.77	39.43	1.07	51.65										1507	2.73
234-236	1.79	2.79	42.41	1.16	53.63										1513	2.70
236-238	1.82	2.76	38.79	1.05	51.13										1499	2.72
238-240	1.81	2.74	38.43	1.03	50.66										1492	2.70
240-242	1.6	2.74	63.30	1.69	62.88	0.1	16.5	42.9	40.5	7.5	3.61	0.27	0.73	85.9	1502	2.41
MEAN	1.88	2.75	33.89	0.91	47.45	2.9	24.1	45.9	27.0	6.0	3.72	0.36	1.12	87.9	1521	2.88

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.71	2.73	48.29	1.29	56.32	0.2	27.2	53.1	19.6	5.7	3.17	0.38	1.37	92.8		
2-4	1.75	2.76	45.52	1.23	55.10											
4-6	1.71	2.80	50.19	1.37	57.81											
6-8	1.71	2.75	48.88	1.31	56.80											
8-10	1.74	2.75	45.83	1.23	55.20											
10-12	1.73	2.73	46.23	1.23	55.23	0.5	20.8	55.1	23.6	6.3	3.31	0.37	1.23	94.0		
12-14	1.75	2.76	45.46	1.22	55.05											
14-16	1.74	2.72	45.28	1.20	54.62											
16-18	1.75	2.75	44.44	1.19	54.39											
18-20	1.78	2.75	42.19	1.13	53.09											
20-22	1.78	2.74	41.74	1.12	52.80	0.8	31.3	27.6	20.3	5.7	3.34	0.35	1.32	92.4		
22-24	1.78	2.76	42.15	1.14	53.17											
24-26	1.80	2.76	40.19	1.08	51.97											
26-28	1.81	2.76	39.62	1.07	51.67										1567	2.83
28-30	1.81	2.82	40.76	1.12	52.87										1582	2.87
30-32	1.83	2.78	37.66	1.02	50.54	1.6	41.2	39.1	18.1	5.2	3.36	0.34	1.33	92.9	1583	2.90
32-34	1.85	2.78	36.37	0.99	49.68										1586	2.93
34-36	1.82	2.75	37.82	1.01	50.37										1580	2.88
36-38	1.82	2.80	39.26	1.07	51.77										1583	2.89
38-40	1.82	2.75	38.30	1.03	50.70										1582	2.88
40-42	1.83	2.76	37.27	1.00	50.12	1.2	38.3	41.3	19.3	5.4	3.39	0.38	1.31	92.5	1576	2.89
42-44	1.79	2.74	40.08	1.07	51.73										1569	2.82
44-46	1.79	2.75	40.36	1.08	51.99										1565	2.81
46-48	1.81	2.75	39.19	1.05	51.25										1560	2.82
48-50	1.81	2.75	38.84	1.04	51.06										1571	2.85
50-52	1.81	2.76	38.82	1.05	51.11	1.4	43.3	36.4	18.9	5.2	3.44	0.35	1.28	93.2	1563	2.84
52-54	1.82	2.72	36.94	0.98	49.55										1567	2.86
54-56	1.82	2.75	37.83	1.01	50.37										1563	2.85
56-58	1.83	2.74	36.90	0.99	49.64										1570	2.87
58-60	1.81	2.74	38.76	1.04	50.88										1566	2.83
60-62	1.83	2.73	36.75	0.98	49.52	2.8	43.6	33.8	19.8	5.3	3.64	0.32	1.26	92.5	1568	2.87
62-64	1.82	2.71	36.61	0.97	49.22										1565	2.85
64-66	1.82	2.70	37.05	0.98	49.43										1568	2.85
66-68	1.80	2.73	39.45	1.05	51.28										1562	2.81
68-70	1.83	2.71	36.38	0.96	49.09										1563	2.86
70-72	1.83	2.73	37.03	0.99	49.67	3.7	42.0	36.1	18.2	5.1	3.64	0.34	1.39	91.2	1570	2.86
72-74	1.83	2.80	38.42	1.05	51.25										1574	2.89
74-76	1.83	2.75	37.31	1.00	50.03										1568	2.87
76-78	1.82	2.71	36.64	0.97	49.26										1566	2.86
78-80	1.82	2.77	38.28	1.03	50.83										1569	2.86
80-82	1.82	2.76	38.36	1.04	50.87	4.3	45.1	32.1	18.5	5.0	3.78	0.34	1.33	88.6	1570	2.86
82-84	1.85	2.75	35.98	0.97	49.17										1574	2.90

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
84-86	1.83	2.75	37.62	1.01	50.29										1567	2.86
86-88	1.83	2.78	38.36	1.04	50.97										1567	2.86
88-90	1.86	2.78	35.78	0.97	49.30										1576	2.93
90-92	1.84	2.77	36.77	0.99	49.83	4.9	46.3	30.2	18.7	4.8	3.84	0.35	1.31	92.4		
92-95	1.91	2.76	31.32	0.84	45.78											
95-100	2.00	2.78														
100-102	1.90	2.76				6.0	48.2	27.5	18.4	4.6	4.05	0.36	1.3	89.6		
102-104	1.88	2.76	34.67	0.96	49.11											
104-106	1.90	2.79	34.75	0.97	49.16											
106-108	1.91	2.83	36.32	1.01	50.27										1555	2.96
108-110	1.91	2.77	34.06	0.95	48.67										1547	2.96
110-112	1.90	2.77	31.46	0.85	46.01	5.1	44.3	33.3	17.4	4.7	3.78	0.27	1.57	91.5	1545	2.94
112-114	1.88	2.80	33.96	0.95	48.59										1548	2.94
114-116	1.93	2.79	34.73	0.97	49.15										1550	2.92
116-118	1.93	2.83	35.78	1.00	49.89										1558	3.00
118-120	1.92	2.77	32.54	0.91	47.52										1553	3.00
120-122	1.91	2.81	31.20	0.86	46.15	33.8	29.3	24.5	12.5	2.5	4.33	0.09	0.66		1556	2.99
122-124	1.85	2.79	32.98	0.92	47.86											
124-126	1.48	2.79	33.39	0.93	48.17											
126-128	1.79	2.77	38.17	1.06	51.51											
128-130	1.85	2.76														
130-132	1.85	2.79	41.65	1.13	53.12	11.4	43.3	28.9	16.0	4.3	4.69	0.23	1.08	91.7		
132-134	1.89	2.82	37.91	1.08	51.08											
134-136	1.91	2.78	36.26	1.06	49.63											
136-138	1.92	2.77	32.86	0.98	47.04											
138-140	1.95	2.78	31.61	0.93	46.16											
140-142	1.91	2.80	31.52	0.86	46.27	5.6	33.4	34.1	27.0	6.0	4.27	0.3	0.99	91.7	1572	3.07
142-144	1.89	2.77	28.63	0.85	43.68										1559	2.99
144-146	1.91	2.82	32.50	0.93	47.23											
146-148	1.99	2.76	32.77	0.98	46.92										1553	2.96
148-150	1.82	2.78	31.89	0.94	46.42					5.1						
MEAN	1.83	2.76	37.87	1.03	50.46	5.5	38.5	35.5	19.1	5.1	3.74	0.32	1.25	91.9	1566	2.89

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Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.81	2.71	37.70	1.00	49.94	0.0	26.5	52.0	21.5	6.0	3.25	0.42	1.20	1487	2.69
2-4	1.78	2.72	40.55	1.08	51.84									1486	2.65
4-6	1.82	2.73	37.70	1.00	50.12									1483	2.70
6-8	1.82	2.71	37.16	0.98	49.61									1484	2.70
8-10	1.87	2.73	33.66	0.90	47.30									1480	2.76
10-12	1.85	2.71	34.62	0.92	47.79	1.8	25.3	51.1	21.9	6.0	3.37	0.32	1.47	1488	2.75
12-14	1.85	2.73	35.25	0.94	48.44									1487	2.74
14-16	1.85	2.79	36.90	1.01	50.13									1487	2.75
16-18	1.87	2.72	32.61	0.86	46.38									1481	2.78
18-20	1.84	2.71	35.49	0.94	48.42									1484	2.72
20-22	1.87	2.71	32.88	0.87	46.54	0.6	28.8	47.3	23.4	6.0	3.50	0.38	1.16	1478	2.76
22-24	1.87	2.72	33.16	0.88	46.83									1484	2.77
24-26	1.90	2.73	31.19	0.83	45.43									1489	2.83
26-28	1.90	2.72	30.60	0.81	44.83									1487	2.83
28-30	1.90	2.84	34.40	0.95	48.82									1492	2.83
30-32	1.88	2.73	32.38	0.86	46.36	2.4	38.5	39.3	19.8	5.5	3.62	0.31	1.32	1495	2.82
32-34	1.90	2.83	33.84	0.94	48.36									1492	2.84
34-36	1.90	2.74	31.16	0.83	45.48									1488	2.83
36-38	1.90	2.75	31.39	0.84	45.74									1501	2.86
38-40	1.95	2.74	27.90	0.75	42.70									1506	2.93
40-42	1.92	2.77	30.85	0.83	45.48	3.3	41.2	36.7	18.9	5.5	3.60	0.33	1.37	1504	2.89
42-44	1.89	2.79	34.01	0.93	48.14									1500	2.83
44-46	1.91	2.74	30.81	0.83	45.24									1490	2.84
46-48	1.95	2.75	28.39	0.76	43.30									1493	2.91
48-50	1.90	2.76	31.55	0.85	45.92									1504	2.86
50-52	1.91	2.76	31.43	0.85	45.89	2.3	43.1	34.9	19.7	5.3	3.66	0.38	1.29	1495	2.85
52-54	1.90	2.76	32.05	0.86	46.31									1497	2.84
54-56	1.90	2.79	32.45	0.88	46.93									1495	2.85
56-58	1.91	2.74	30.75	0.82	45.10									1497	2.85
58-60	1.90	2.81	33.62	0.92	48.03									1496	2.84
60-62	1.89	2.75	32.37	0.87	46.52	2.2	41.5	35.4	20.9	5.5	3.65	0.34	1.29	1490	2.82
62-64	1.91	2.82	32.83	0.91	47.51									1494	2.86
64-66	1.90	2.77	32.23	0.87	46.58									1499	2.85
66-68	1.91	2.74	30.82	0.83	45.21									1498	2.86
68-70	1.95	2.75	28.03	0.75	42.98									1498	2.92
70-72	1.90	2.78	32.27	0.88	46.73	4.6	44.0	32.7	18.7	5.1	3.78	0.30	1.34	1501	2.86
72-74	1.92	2.74	29.76	0.80	44.37									1499	2.88
74-76	1.92	2.78	31.25	0.85	45.90									1501	2.88
76-78	1.94	2.77	29.73	0.81	44.60									1497	2.90
78-80	1.93	2.76	27.67	0.75	42.71									1505	2.90
80-82	1.96	2.75	27.34	0.73	42.32	2.6	5.0	36.2	19.1	5.2	3.37	0.29	1.36	1501	2.94
82-84	1.96	2.78	27.67	0.75	42.92									1507	2.96

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.97	2.74	30.29	0.81	44.74									1508	2.97
86-88	1.91	2.81	23.53	0.64	39.19									1513	2.89
88-90	2.05	2.75	22.30	0.60	37.43									1410	2.89
90-92	2.04	2.77	31.05	0.84	45.65	6.2	45.7	31.1	17.0	4.5	3.82	0.29	1.37	1412	2.89
92-95	1.96	2.76	27.85	0.75	42.87									1414	2.77
95-98	1.92	2.79	26.41	0.72	41.84									1408	2.70
98-100	1.99	2.80	28.63	0.78	43.89									1405	2.75
100-102	1.99	2.75	27.12	0.73	42.10	6.8	44.5	31.1	17.5	4.5	3.98	0.25	1.30	1435	2.86
102-104	1.96	2.77	26.42	0.71	41.65									1508	2.96
104-106	1.96	2.82	28.50	0.78	43.96									1508	2.96
106-108	1.98	2.81	27.60	0.76	43.12									1513	3.00
108-110	1.97	2.82	27.15	0.75	42.75									1516	2.99
110-112	1.98	2.80	26.38	0.72	41.87	3.2	43.6	32.6	20.9	5.4	3.84	0.30	1.29	1512	3.00
112-114	1.99	2.75	25.73	0.69	40.88									1511	3.01
114-116	2.00	2.80	27.70	0.76	43.13									1511	3.02
116-118	1.98	2.78	26.79	0.73	42.14									1511	3.00
118-120	1.99	2.86	28.24	0.79	44.06									1520	3.01
120-122	1.99	2.77	25.86	0.70	41.12	5.0	44.1	30.8	20.1	5.0	4.05	0.29	1.32	1515	3.01
122-124	1.99	2.78	25.53	0.69	40.97									1504	3.00
124-126	2.01	2.79	25.79	0.70	41.31									1509	3.01
126-128	2.01	2.77	25.73	0.70	41.06									1515	3.04
128-130	2.00	2.79	25.20	0.69	40.74									1509	3.03
130-132	2.02	2.82	25.84	0.71	41.61	4.0	39.9	36.8	19.3	5.5	4.04	0.27	1.17	1510	3.02
132-134	2.02	2.78	23.33	0.63	38.79									1507	3.04
134-136	2.04	2.77	24.10	0.65	39.50									1493	3.01
136-138	2.03	2.76	23.56	0.64	38.87									1498	3.06
138-140	2.03	2.78	24.24	0.66	39.66									1509	3.06
140-142	2.02	2.79	24.78	0.68	40.32	3.9	35.8	31.1	29.3	5.9	4.34	0.26	0.91	1515	3.08
142-144	2.02	2.78	24.52	0.66	39.93									1515	3.07
144-146	2.02	2.82	26.72	0.73	42.35									1516	3.07
146-148	2.00	2.82	26.18	0.72	41.87									1521	3.07
148-150	2.01	2.81	27.38	0.75	42.91									1516	3.03
150-152	1.99	2.75	26.09	0.70	41.21	3.6	37.6	32.4	26.7	5.9	4.09	0.34	1.00	1515	3.05
152-154	1.98	2.77	27.59	0.75	42.73									1504	2.99
154-156	1.97	2.75	26.57	0.71	41.66									1502	2.98
156-158	1.98	2.77	27.09	0.73	42.32									1503	2.96
158-160	1.98	2.78	23.85	0.65	39.29									1502	2.97
160-162	2.03	2.76	24.51	0.66	39.77	3.8	41.5	26.3	28.5	5.8	4.29	0.34	0.89	1499	2.96
162-164	2.01	2.77	27.00	0.73	42.21									1499	3.05
164-166	1.98	2.76	27.03	0.73	42.18									1509	3.04
166-168	1.97	2.80	30.92	0.85	45.83									1516	3.00
168-170	1.93	2.76	31.40	0.85	45.87									1526	3.01
170-172	1.91	2.79	30.80	0.84	45.61	2.3	29.4	33.8	34.5	6.6	4.05	0.33	0.80	1508	2.91
172-174	1.93	2.76	29.61	0.80	44.39									1513	2.89
174-176	1.93	2.76	27.88	0.75	42.89									1490	2.87

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
176-178	1.96	2.80	29.60	0.81	44.71									1489	2.88
178-180	1.95	2.78	31.71	0.86	46.28									1504	2.94
180-182	1.91	2.82	33.23	0.91	47.77	1.6	24.5	36.0	38.0	7.0	3.91	0.30	0.74	1503	2.93
182-184	1.90	2.75	28.62	0.77	43.44									1512	2.89
184-186	1.94	2.78	29.36	0.80	44.32									1508	2.87
186-188	1.94	2.74	27.09	0.73	42.03									1499	2.91
188-190	1.96	2.73												1495	2.90
190-192	1.80	2.78	39.78	1.07	51.63	0.8	18.6	42.4	38.2	7.3	3.66	0.26	0.75		
192-194	1.77	2.75	43.99	1.20	54.47									1553	2.80
194-196	1.80	2.79	38.81	1.03	50.80										
196-198	1.87	2.72	33.44	0.89	47.22									1488	2.68
198-200	1.88	2.74	32.96	0.88	46.94									1483	2.78
200-202	1.82	2.75	38.14	1.03	50.73	0.9	11.8	45.9	41.3	7.6	3.48	0.32	0.68	1522	2.86
202-204	1.79	2.76	40.95	1.10	52.39									1555	2.84
204-206	1.83	2.75	37.83	1.03	50.64									1558	2.79
206-208	1.85	2.78	35.02	0.94	48.37									1539	2.82
208-210	1.27	2.74												1524	2.82
210-212	1.07	2.74				4.9	10.4	45.5	39.3	7.5	4.08	0.16	0.96	1538	1.95
212-214	1.75	2.76												1550	1.66
214-216	1.74	2.81													
216-218															
218-220															
220-222						6.1	6.9	41.2	45.9	8.0	4.23	-0.05	0.99		
MEAN	1.91	2.77	30.19	0.82	44.70	3.0	32.8	37.3	25.2	5.8	3.79	0.31	1.14	1499	2.87

KW-PE-GC-227

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.69	2.73	51.12	1.37	57.84	0.4	27.9	53.6	18.2	5.6	3.06	0.35	1.38		
2-4	1.74	2.75	45.94	1.23	55.18										
4-6	1.73	2.74	47.03	1.26	55.78										
6-8	1.74	2.75	46.12	1.24	55.34										
8-10	1.74	2.75	45.80	1.23	55.19										
10-12	1.73	2.75	47.09	1.26	55.78	0.4	24.6	54.0	21.0	6.0	3.16	0.45	1.42		
12-14	1.74	2.74	45.55	1.22	54.99										
14-16	1.69	2.75	51.48	1.39	58.08										
16-18	1.74	2.76	45.55	1.22	55.03										
18-20	1.77	2.75	42.89	1.15	53.52										
20-22	1.80	2.75	40.24	1.08	51.97	1.3	33.3	44.5	21.0	5.8	3.46	0.3	1.15		
22-24	1.77	2.75	43.04	1.16	53.63										
24-26	1.76	2.75	44.16	1.19	54.30										
26-28	1.74	2.76	45.41	1.22	54.94										
28-30	1.78	2.75	41.77	1.12	52.84										
30-32	1.78	2.75	41.91	1.12	52.87	1.6	40.5	40.5	17.5	5.1	3.25	0.38	1.32		
32-34	1.75	2.74	44.82	1.20	54.64										
34-36	1.82	2.75	38.24	1.02	50.60									1531	2.68
36-38	1.80	2.74	39.59	1.06	51.50									1581	2.87
38-40	1.78	2.75	41.26	1.11	52.50									1583	2.85
40-42	1.84	2.74	36.22	0.97	49.28	1.9	39.8	39.4	18.9	5.4	3.49	0.37	1.33	1575	2.81
42-44	1.77	2.75	43.05	1.16	53.63									1589	2.92
44-46	1.80	2.75	40.09	1.08	51.84									1574	2.78
46-48	1.83	2.75	37.71	1.01	50.36									1563	2.81
48-50	1.81	2.75	39.12	1.05	51.31									1579	2.88
50-52	1.80	2.76	39.90	1.07	51.79	0.7	36.3	45.5	20.5	5.7	3.52	0.41	1.28	1576	2.86
52-54	1.81	2.76	38.87	1.05	51.11									1567	2.82
54-56	1.82	2.75	38.65	1.04	51.00									1575	2.85
56-58	1.81	2.76	39.06	1.05	51.29									1578	2.87
58-60	1.78	2.76	41.73	1.13	52.94									1572	2.85
60-62	1.79	2.76	40.99	1.11	52.50	7.3	36.1	38.8	17.8	4.8	3.28	0.02	1.14	1570	2.80
62-64	1.83	2.76	37.82	1.02	50.58									1561	2.80
64-66	1.81	2.77	39.37	1.06	51.46									1573	2.88
66-68	1.83	2.76	37.51	1.01	50.26									1575	2.85
68-70	1.81	2.76	38.95	1.05	51.23									1569	2.87
70-72	1.83	2.76	38.09	1.03	50.74	3.8	45.1	34.2	16.8	4.7	3.43	0.27	1.56	1573	2.85
72-74	1.84	2.77	36.76	0.99	49.80									1570	2.87
74-76	1.82	2.76	38.38	1.04	50.94									1573	2.89
76-78	1.81	2.77	39.12	1.06	51.37									1576	2.87
78-80	1.80	2.77	40.30	1.09	52.07									1573	2.85
80-82	1.85	2.76	36.44	0.99	49.63	6.6	43.9	31.7	17.9	4.7	3.8	0.29	1.4	1572	2.83
82-84	1.84	2.77	36.95	1.00	49.97									1577	2.91

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (Phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
84-86	1.84	2.77	37.31	1.01	50.28									1578	2.90
86-88	1.83	2.78	37.50	1.01	50.29									1592	2.93
88-90	1.91	2.76													
90-92	1.99	2.77				3.8	42.4	33.6	20.1	5.2	3.91	0.3	1.29	1568	2.99
92-95	1.68	2.77													
95-98	1.74	2.77													
98-100	1.86	2.77	34.97	0.95	48.61										
100-102	1.88	2.77	33.97	0.92	47.89	8.7	43.1	29.4	18.9	4.2	3.93	0.2	1.23		
102-104	1.92	2.82	32.09	0.88	46.93										
104-106	1.94	2.81	30.28	0.83	45.36									1553	2.91
106-108	1.91	2.80	32.35	0.88	46.90									1555	2.99
108-110	1.95	2.79	29.40	0.80	44.44									1553	3.02
110-112	1.93	2.78	30.10	0.82	44.97	10.5	41.1	28.1	20.3	4.4	4.58	0.23	1.19		
112-114	1.95	2.81	29.81	0.82	44.98									1555	3.03
114-116	1.94	2.77	29.49	0.80	44.35									1546	2.99
116-118	1.92	2.83	32.40	0.90	47.25									1560	3.04
118-120	1.96	2.86	30.35	0.85	45.87									1572	3.05
120-122	1.97	2.77	27.13	0.73	42.33	15.9	33.8	25.6	24.6	4.5	5.09	0.14	0.89	1556	2.99
122-124	2.03	2.77	23.81	0.64	39.14									1564	3.07
124-126	1.93	2.77	29.72	0.80	44.52									1584	3.13
126-128	1.95	2.80	29.71	0.81	44.82									1547	3.14
128-130	1.96	2.82	29.62	0.82	44.91									1534	2.97
130-132	1.89	2.77	33.00	0.89	47.17	11.7	29.6	30.5	28.3	5.4	4.84	0.14	0.96	1539	3.00
132-134	1.92	2.75	30.08	0.81	44.68									1560	3.05
134-136	1.94	2.84	30.85	0.85	46.07									1544	2.92
136-138	1.94	2.83	31.14	0.86	46.24									1543	2.96
138-140	1.95	2.77	28.94	0.78	43.95									1559	3.03
140-142	1.94	2.80	30.08	0.82	45.13	8.0	44.2	32.0	15.9	4.4	3.74	0.26	1.73	1563	3.03
142-144	1.94	2.82	30.89	0.85	45.98									1552	3.02
MEAN	1.84	2.77	37.60	1.02	50.07	5.5	37.4	37.4	19.8	5.1	3.77	0.27	1.28	1566	2.92

3.2.1.3 Marquesas Keys Physical and Geoacoustic Property Data:

KW-PE-DC-190-2
KW-PE-GC-203
KW-PE-GC-235
KW-PE-GC-241

KW-PE-DC-190-2

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%) Meas.	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean Grain Size (Phi)	p-wave velocity (m/s)
0-2	1.89	2.69	57.67	0.87	46.62	0.80	14.59	67.63	16.99	5.76	1519
2-4	1.94	2.71	53.26	0.72	42.00						1505
4-6	2.03	2.72	45.89	0.59	36.98						1509
6-8	2.01	2.72	39.59	0.62	38.36						1502
8-10	1.95	2.70	45.97	0.71	41.48						
10-12	1.99	2.70		0.64	39.00	3.40	19.77	57.61	19.22	5.44	1493
MEAN	1.97	2.71	48.48	0.69	40.74	2.1	17.2	62.6	18.1	5.6	1506

KW-PE-GC-203

Sample Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content (%)	Void Ratio	Porosity (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MGS (phi)	Sorting	Skewness	Kurtosis	$CaCO_3$ (%)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0-2	1.75	2.66	42.33	1.10	52.37	4.4	18.2	57.3	20.2	5.7	2.95	0.34	1.65	81.0	1524	2.66
2-4	1.78	2.72	40.39	1.07	51.75									88.1	1530	2.73
4-6	1.79	2.70	39.12	1.03	50.74									84.5	1527	2.73
6-8	1.82	2.71	36.73	0.97	49.27									86.4	1536	2.80
8-10	1.80	2.68	37.36	0.98	49.42									86.2	1535	2.77
10-12	1.86	2.75	34.74	0.93	48.26	25.3	12.3	46.4	16.0	3.4	4.47	-0.19	0.87	84.4	1549	2.88
12-14	1.89	2.74	31.93	0.85	46.05									87.2	1542	2.92
14-16	1.96	2.72	27.02	0.72	41.83									85.3	1541	3.02
16-18	1.89	2.71	31.33	0.83	45.34									85.8	1527	2.88
18-20	1.85	2.71	34.44	0.91	47.67									88.3	1527	2.82
20-22	1.83	2.71	35.73	0.95	48.59	13.8	15.7	50.7	19.8	4.6	4.29	-0.08	1.73	83.1	1528	2.80
22-24	1.92	2.70	28.60	0.75	42.99									86.5	1540	2.96
24-26	1.89	2.77	33.11	0.90	47.23									82.7	1531	2.89
26-28	1.88	2.70	31.60	0.83	45.41									88.8	1554	2.92
28-30	1.84	2.70	34.59	0.91	47.66									87.0	1548	2.85
30-32	1.82	2.71	37.10	0.98	49.56	10.0	20.7	53.5	15.9	4.9	3.77	0.01	1.42	87.6	1533	2.79
32-34	1.85	2.72	34.91	0.93	48.09									87.8	1520	2.81
34-36	1.84	2.71	35.09	0.93	48.12									86.5	1527	2.81
36-38	1.89	2.70	31.01	0.82	44.95									74.2	1536	2.90
38-40	1.87	2.70	32.72	0.86	46.34									86.2	1531	2.86
40-42	1.85	2.72	34.20	0.91	47.58	8.4	18.3	57.6	15.8	5.2	3.58	0.1	1.49	83.8	1518	2.82
42-44	1.80	2.75	39.38	1.06	51.35									82.9	1509	2.72
44-46	1.82	2.75	38.04	1.02	50.52									85.8	1512	2.75
46-48	1.81	2.75	38.61	1.04	50.87									87.1	1518	2.75
48-50	1.80	2.70	38.71	1.02	50.48									87.9	1513	2.72
50-52	1.84	2.72	35.11	0.93	48.24	5.1	17.4	48.7	28.8	6.6	3.35	0.2	0.95	87.6	1516	2.80
52-54	1.82	2.70	36.77	0.97	49.18									88.1	1524	2.77
54-56	1.82	2.70	37.12	0.98	49.50									84.8	1521	2.76
56-58	1.80	2.76	40.29	1.08	52.01									87.2	1526	2.74
58-60	1.77	2.69	41.24	1.08	51.98									87.3	1517	2.68
60-62	1.76	2.69	42.36	1.11	52.66	0.8	11.3	57.5	30.3	6.8	2.81	0.49	0.71	87.4	1518	2.66
62-64	1.77	2.69	40.74	1.07	51.73									83.4	1517	2.69
64-66	1.77	2.70	40.95	1.08	51.91									84.8	1519	2.69
66-68	1.76	2.69	41.36	1.09	52.04									87.0	1510	2.66
68-70	1.78	2.72	40.75	1.08	51.95									85.0	1517	2.70
70-72	1.76	2.70	42.10	1.11	52.62	0.9	10.8	55.4	33.0	7.1	2.79	0.44	0.75	84.9	1517	2.67
72-74	1.78	2.71	40.66	1.07	51.79									86.1	1517	2.70
74-76	1.81	2.72	38.05	1.01	50.25									87.8	1521	2.75
76-78	1.76	2.80	44.93	1.23	55.10									87.4	1527	2.69
78-80	1.78	2.71	41.16	1.09	52.18									87.5	1523	2.70
80-82	1.79	2.70	39.49	1.04	50.99	1.8	11.0	57.2	30.1	6.6	2.79	0.49	0.79	87.1	1517	2.71
82-84	1.85	2.73	35.13	0.94	48.37									87.5	1515	2.80
84-86	1.85	2.71	34.02	0.90	47.34									86.7		

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	% Carb	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
86-88	1.89	2.74	32.09	0.86	46.17									85.5	1525	2.88
88-90	1.87	2.69	32.49	0.85	46.08									86.7		
90-92	1.77	2.70	40.97	1.08	51.92	5.7	18.0	50.8	25.5	6.0	3.4	0.3	1.27	84.1		
92-94	1.78	2.69	39.86	1.05	51.18									86.6		
94-96	1.82	2.70	36.73	0.97	49.24									83.4		
96-98	1.81	2.70	37.71	0.99	49.82									84.1		
98-100	1.79	2.72	40.15	1.06	51.57									83.3		
100-102	1.78	2.69	40.04	1.05	51.31	1.6	13.6	49.2	35.6	7.4	3.07	0.31	0.79	84.2		
102-104	1.76	2.73	42.74	1.14	53.26											
104-106	1.77	2.73	42.13	1.12	52.92											
106-108	1.78	2.73	41.08	1.10	52.27											
108-110	1.79	2.74	40.90	1.09	52.24											
110-112	1.79	2.71	40.05	1.06	51.47	2.8	14.8	43.7	38.7	7.5	3.3	0.07	0.84	86.0		
112-114	1.80	2.73	39.68	1.06	51.41											
114-116	1.75	2.74	44.19	1.18	54.19											
116-118	1.80	2.74	39.26	1.05	51.23										1494	2.76
118-120	1.85	2.74	35.53	0.95	48.74										1491	2.73
120-122	1.83	2.73	36.60	0.98	49.43	2.2	15.3	43.8	38.7	7.7	3.15	0.13	0.72	80.2	1494	2.76
122-124	1.85	2.75	35.62	0.96	48.86										1485	2.66
124-126	1.79	2.75	40.83	1.09	52.27										1487	2.72
126-128	1.83	2.75	37.09	0.99	49.87										1496	2.80
128-130	1.87	2.75	33.69	0.91	47.51										1506	2.82
130-132	1.87	2.74	33.53	0.90	47.25	1.9	23.0	38.1	37.1	7.4	3.31	0.24	0.76	85.2	1496	2.79
132-133	1.87	2.75	34.16	0.92	47.82										1509	2.81
133-136	1.86	2.76	35.21	0.95	48.71										1493	2.71
136-138	1.82	2.76	38.60	1.04	50.95										1487	2.72
138-140	1.83	2.76	37.43	1.01	50.20										1484	2.70
140-142	1.82	2.76	38.46	1.04	50.92	3.0	19.9	39.7	37.3	6.9	3.34	0.07	0.75	86.0	1490	2.73
142-144	1.83	2.76	37.35	1.01	50.19										1490	2.79
144-146	1.87	2.75	34.04	0.91	47.76										1496	2.82
146-148	1.88	2.77	33.46	0.91	47.54										1497	2.77
148-150	1.85	2.76	35.99	0.97	49.27										1502	2.76
150-152	1.83	2.74	36.63	0.98	49.53	7.9	23.8	34.6	33.6	6.2	3.87	0.12	0.89	85.2	1490	2.84
152-154	1.91	2.76	31.25	0.84	45.71										1501	2.83
154-156	1.89	2.76	32.84	0.89	46.97										1538	2.87
156-158	1.87	2.76	34.35	0.93	48.07										1516	2.82
158-160	1.86	2.76	34.92	0.94	48.48										1498	2.82
160-162	1.88	2.74	32.90	0.88	46.86	6.8	32.3	31.5	29.4	5.6	4.02	0.17	0.8	82.1	1519	2.84
162-164	1.87	2.76	34.22	0.92	47.99										1515	2.84
164-166	1.88	2.77	33.94	0.92	47.84										1512	2.82
166-168	1.87	2.78	35.16	0.96	48.87											
168-170	1.97	2.78	27.80	0.75	42.98											
MEAN	1.83	2.73	36.86	0.98	49.40	6.0	17.4	48.0	28.6	6.2	3.43	0.19	1.01	85.53	1516	

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Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio meas.	Porosity (%) meas.	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
0-2	1.83	2.74	37.00	1.01	50.37	19.4	25.8	39.5	15.3	3.6		
2-4	1.83	2.71	34.80	0.94	48.57							
4-6	1.81	2.70	36.74	0.99	49.83							
6-8	1.78	2.72	37.85	1.03	50.69							
8-10	1.70	2.70	42.89	1.16	53.63							
10-12	1.78	2.70	34.14	0.92	48.01	2.0	14.7	59.8	23.4	6.1		
12-14	1.81	2.71	38.06	1.03	50.76							
14-16	1.83	2.71	35.87	0.97	49.27							
16-18	1.78	2.72	37.50	1.02	50.48							
18-20	1.81	2.71	39.60	1.07	51.77							
20-22	1.87	2.72	33.69	0.92	47.79	2.1	9.7	59.5	28.8	6.9		
22-24	1.89	2.71	34.18	0.93	48.12						1511	2.85
24-26	1.91	2.72	31.42	0.85	46.05							
26-28	1.90	2.73	34.81	0.95	48.71						1539	2.93
28-30	1.91	2.73	33.02	0.90	47.37						1550	2.96
30-32	1.88	2.72	33.96	0.92	47.99	21.9	18.6	37.5	21.8	4.2	1514	2.85
32-34	1.89	2.72	34.41	0.94	48.35						1511	2.85
34-36	1.86	2.72	37.36	1.02	50.38						1519	2.82
36-38	1.87	2.72	35.55	0.97	49.20						1519	2.84
38-40	1.89	2.72	34.93	0.95	48.72						1518	2.86
40-42	1.90	2.73	34.30	0.93	48.32	13.0	16.7	45.4	25.0	4.9	1504	2.85
42-44	1.83	2.73	38.41	1.05	51.17						1508	2.76
44-46	1.85	2.73	38.69	1.06	51.37						1508	2.79
46-48	1.83	2.72	41.45	1.13	52.98						1508	2.76
48-50	1.79	2.71	42.57	1.15	53.59						1512	2.70
50-52	1.81	2.73	38.43	1.05	51.17	0.9	4.9	58.1	36.1	7.5	1518	2.75
52-54	1.82	2.71	41.63	1.13	53.02						1503	2.73
54-56	1.80	2.72	39.33	1.07	51.71						1505	2.71
56-58	1.79	2.72	42.42	1.15	53.55						1509	2.71
58-60	1.80	2.72	42.00	1.14	53.36						1499	2.70
60-62	1.78	2.72	39.57	1.08	51.85	12.9	8.0	52.2	26.9	6.0	1513	2.69
62-64	1.83	2.71	43.32	1.18	54.04						1520	2.78
64-66	1.81	2.72	48.05	1.31	56.64						1505	2.72
66-68	1.77	2.72	47.68	1.30	56.47						1509	2.67
68-70	1.76	2.71	41.95	1.14	53.23						1496	2.63
70-72	1.77	2.71	39.69	1.07	51.79	4.6	10.1	557.6	27.7	6.6	1506	2.67
72-74	1.81	2.70	44.71	1.21	54.71						1520	2.76
74-76	1.81	2.72	51.46	1.40	58.31						1513	2.75

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio meas.	Porosity (%) meas.	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
76-78	1.76	2.72									1493	2.63
78-80	1.79	2.73	40.07	1.09	52.24						1482	2.65
80-82	1.71	2.72	46.17	1.26	55.68	6.5	8.9	54.0	30.6	6.7	1484	2.54
82-84	1.75	2.72	47.82	1.30	56.52						1507	2.64
84-86	1.82	2.72	45.80	1.24	55.43						1511	2.75
86-88	1.82	2.72	43.50	1.18	54.20						1512	2.75
88-90	1.81	2.72										
90-92	1.79	2.71	39.98	1.08	52.02	1.5	10.2	55.8	29.5	6.7	1488	2.67
92-95	1.85	2.72	37.39	1.02	50.43							
95-98	1.86	2.70	33.67	0.91	47.65							
98-100	1.86	2.71	42.12	1.14	53.32							
100-102	1.73	2.72	43.84	1.19	54.41	0.5	8.3	55.0	36.3	7.4		
102-104	1.67	2.72	36.39	0.99	49.77							
104-106	1.70	2.72	42.30	1.15	53.52							
106-108	1.78	2.72	39.78	1.08	51.98							
108-110	1.74	2.72	37.91	1.03	50.79							
110-112	1.75	2.72	43.39	1.18	54.10	0.9	6.0	65.2	28.0	6.8		
112-114	1.71	2.71	39.92	1.08	51.97							
114-116	1.72	2.70	44.08	1.19	54.35							
116-118	1.69	2.71	44.83	1.21	54.85							
118-120	1.67	2.71	46.36	1.26	55.67							
120-122	1.70	2.70	49.49	1.34	57.19	1.0	6.8	61.2	31.0	6.9		
122-124	1.72	2.72	48.60	1.32	56.91							
124-126	1.73	2.71	49.76	1.35	57.45						1499	2.59
126-128	1.79	2.72	49.28	1.34	57.23						1511	2.71
128-130	1.75	2.72	47.54	1.29	56.37						1497	2.62
130-132	1.73	2.72	45.88	1.25	55.48	0.1	7.9	56.5	35.4	7.3	1494	2.58
132-134	1.69	2.71	47.45	1.28	56.23						1482	2.50
134-136	1.67	2.71	49.44	1.34	57.28							
136-138	1.59	2.71	50.76	1.37	57.88							
138-140	1.65	2.69	57.69	1.55	60.85						1474	2.44
140-142	1.71	2.70	66.94	1.81	64.41	2.8	3.9	60.6	32.8	7.1	1521	2.61
142-144	1.87	2.72	58.50	1.59	61.38						1525	2.85
144-146	1.86	2.72	43.28	1.18	54.04						1495	2.77
146-148	1.83	2.72	37.76	1.03	50.66						1491	2.73
148-150	1.80	2.71	42.20	1.14	53.35						1492	2.69
150-152	1.80	2.72	44.92	1.22	54.96	21.6	14.9	34.5	29.1	4.9		
152-154	1.83	2.74	41.19	1.13	53.01						1544	2.83
154-156	1.80	2.73	39.77	1.09	52.06						1518	2.73
156-158	1.82	2.73	36.70	1.00	50.01						1533	2.79

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio meas.	Porosity (%) meas.	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)	Impedance ($g/cm^2 s \times 10^5$)
158-160	1.79	2.73	38.13	1.04	50.96						1524	2.72
160-162	1.76	2.73	35.64	0.97	49.27	26.5	12.0	30.7	30.8	4.8	1545	2.72
162-164	1.79	2.72	38.71	1.05	51.28						1529	2.74
164-166	1.74	2.72	40.54	1.10	52.47						1644	2.87
166-168	1.76	2.73	39.67	1.08	52.00						1534	2.70
168-170	1.80	2.74	41.40	1.13	53.11						1534	2.76
170-172	1.75	2.74	37.89	1.04	50.92	18.3	14.5	36.5	30.7	4.9	1542	2.70
172-174	1.80	2.72	36.10	0.98	49.57						1537	2.76
174-176	1.79	2.73	41.60	1.13	53.15						1534	2.75
176-178	1.81	2.73	40.82	1.11	52.71							
178-180	1.85	2.74	37.51	1.03	50.69						1530	2.84
180-182	1.85	2.74	35.21	0.96	49.07	13.2	13.5	38.1	35.2	5.6	1544	2.85
182-184	1.85	2.74	34.73	0.95	48.80						1559	2.89
184-186	1.86	2.73	36.27	0.99	49.73						1552	2.88
186-188	1.84	2.74	35.72	0.98	49.51							
188-190	1.82	2.74	34.84	0.95	48.83							
190-192	1.92	2.74	34.93	0.96	48.89	24.0	12.6	31.5	32.0	5.0		
192-194	1.94	2.74	29.63	0.81	44.81							
194-196	1.89	2.73	29.50	0.81	44.61						1549	2.93
196-198	1.88	2.74	27.82	0.76	43.23							
198-200	1.88	2.75	34.65	0.95	48.81						1547	2.90
200-202	1.84	2.75				30.1	17.3	27.4	25.3	4.5		
202-204	1.97	2.74										
204-206	1.90	2.77	34.89	0.97	49.11						1545	2.94
206-208	1.85	2.77	34.60	0.96	48.94						1539	2.85
208-210	1.81	2.74	33.64	0.92	47.96						1531	2.77
210-212	1.80	2.76	36.52	1.01	50.19	15.3	16.1	34.1	34.5	5.4	1507	2.71
212-214	1.83	2.75	38.96	1.07	51.77						1507	2.76
214-216	1.86	2.75	40.30	1.11	52.56						1516	2.82
216-218	1.87	2.76	44.40	1.22	55.05						1508	2.82
218-220	1.82	2.76	41.44	1.14	53.35						1515	2.76
220-222	1.89	2.75	40.98	1.13	53.00	24.6	16.1	27.7	31.7	4.9	1518	2.87
222-224	1.82	2.75	40.44	1.11	52.65						1520	2.77
224-226	1.94	2.75	40.31	1.11	52.55						1565	3.04
226-228	1.91	2.75	43.79	1.20	54.61						1566	2.99
228-230	1.92	2.77	41.15	1.14	53.22						1554	2.98
230-232	1.93	2.76	37.96	1.05	51.13	12.2	29.9	29.0	28.9	5.1	1567	3.03
232-234	1.94		32.28								1569	3.05
234-236	1.87	2.76	36.31	1.00	50.06							
236-238	1.96	2.76	32.17	0.89	47.07							

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio meas.	Porosity (%) meas.	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
238-240	2.01	2.76	33.87	0.94	48.35							
242-244		2.78	34.29			4.0	24.1	33.8	38.2	6.6		
MEAN	1.81	2.73	40.18	1.10	52.04	11.5	12.8	67.0	29.4	5.8	1521	2.77

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Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2 s \times 10^5$)
0-2	1.83	2.72	30.92	0.84	45.68	15.1	33.1	33.5	16.4	3.7	4.32	0.01	0.96		
2-4	1.83	2.73	27.13	0.74	42.55										
4-6	1.75	2.71	34.60	0.94	48.39										
6-8	1.74	2.70	39.08	1.06	51.34										
8-10	1.74	2.70	39.39	1.06	51.54										
10-12	1.85	2.70	37.22	1.00	50.12	29.2	18.5	35.4	16.8	3.5	4.66	-0.08	0.66		
12-14	1.75	2.70	35.97	0.97	49.27										
14-16	1.78	2.70	39.19	1.06	51.41										
16-18	1.79	2.70	36.75	0.99	49.81										
18-20	1.84	2.70	35.56	0.96	48.98										
20-22	1.90	2.71	34.19	0.93	48.10	10.2	22.4	42.7	24.7	5.0	4.55	0.01	0.96		
22-24	1.89	2.72	31.66	0.86	46.27										
24-26	1.88	2.72	31.52	0.86	46.16										
26-28	1.92	2.72	33.21	0.90	47.46									1545	2.96
28-30	1.91	2.72	31.71	0.86	46.31									1560	2.97
30-32	1.84	2.72	30.44	0.83	45.29	13.6	21.5	39.4	25.6	4.7	4.83	-0.03	0.8	1554	2.86
32-34	1.86	2.72	36.58	1.00	49.88									1529	2.85
34-36	1.78	2.72	39.51	1.07	51.80									1546	2.75
36-38	1.86	2.72	35.95	0.98	49.44									1543	2.87
38-40	1.86	2.73	33.97	0.93	48.11									1542	2.87
40-42	1.88	2.72	35.67	0.97	49.24	8.0	17.0	46.8	28.2	5.5	4.45	0	1.22	1525	2.87
42-44	1.86	2.73	36.00	0.98	49.57									1539	2.87
44-46	1.82	2.72	36.23	0.99	49.63									1547	2.81
46-48	1.85	2.72	36.91	1.00	50.10									1533	2.84
48-50	1.83	2.72	37.24	1.01	50.32									1509	2.76
50-52	1.82	2.72	38.47	1.05	51.13	14.4	11.2	43.0	31.4	5.2	4.98	-0.08	1.08	1515	2.76
52-54	1.81	2.72	43.27	1.18	54.07									1510	2.74
54-56	1.82	2.72	40.31	1.10	52.30									1511	2.74
56-58	1.83	2.73	38.43	1.05	51.20									1499	2.74
58-60	1.85	2.73	40.50	1.11	52.51									1523	2.82
60-62	1.86	2.73	41.93	1.14	53.37	18.2	14.0	41.6	26.2	4.5	5.09	-0.07	0.87	1515	2.82
62-64	1.84	2.72	37.99	1.03	50.82									1523	2.80
64-66	1.90	2.73	39.60	1.08	51.95										
66-68	1.84	2.73	41.51	1.13	53.12										
68-70	1.96	2.72	39.38	1.07	51.72									1544	3.03
70-72	1.85	2.72	41.48	1.13	53.02	10.9	11.3	48.6	29.3	6.1	4.16	0.1	1.27	1538	2.85
72-74	1.82	2.71	43.31	1.17	54.00									1534	2.80
74-76	1.83	2.72	35.48	0.97	49.11									1512	2.77

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
76-78	1.76	2.73	39.11	1.07	51.64									1502	2.64
78-80	1.74	2.71	39.36	1.07	51.61									1499	2.61
80-82	1.76	2.71	40.80	1.11	52.51	11.8	10.6	50.4	27.2	5.4	4.48	-0.03	1.38	1493	2.63
82-84	1.74	2.71	46.80	1.27	55.91									1503	2.62
84-86	1.77	2.71	46.63	1.26	55.82									1492	2.65
86-88	1.81	2.71	47.30	1.28	56.18									1511	2.73
88-90	1.81	2.71	49.03	1.33	57.06									1515	2.74
90-92	1.83	2.71	50.82	1.38	57.93										
92-95	1.69	2.71	48.98	1.33	57.03										
95-98	1.03	2.73	41.50	1.13	53.12										
98-100	1.36	2.73	38.72	1.06	51.39										
100-102	1.70	2.73	41.19	1.12	52.93	3.7	9.8	48.7	37.8	7.1	3.64	0.25	0.95		
102-104	1.78	2.71	38.55	1.04	51.09										
104-106	1.82	2.71	45.94	1.24	55.46										
106-108	1.81	2.72	45.18	1.23	55.14										
108-110	1.85	2.72	45.00	1.22	55.03										
110-112	1.90	2.72	44.42	1.21	54.72	5.2	9.1	51.8	33.9	6.9	3.71	0.24	1.09	1502	2.85
112-114	1.84	2.72	43.62	1.19	54.26									1501	2.76
114-116	1.86	2.72	44.15	1.20	54.57									1490	2.76
116-118	1.84	2.73	41.22	1.13	52.95									1490	2.74
118-120	1.87	2.74	39.36	1.08	51.89									1491	2.78
120-122	1.89	2.75	39.27	1.08	51.92	15.8	17.6	35.8	30.8	5.0	5.09	-0.06	0.72	1507	2.85
122-124	1.87	2.73	42.17	1.15	53.52									1511	2.83
124-126	1.90	2.74	40.55	1.11	52.63									1523	2.90
126-128	1.94	2.74	41.27	1.13	53.07									1508	2.92
128-130	1.89	2.74	39.86	1.09	52.20									1519	2.87
130-132	1.90	2.74	37.93	1.04	50.97	14.2	32.3	28.3	25.3	4.6	4.87	0.05	0.75	1511	2.88
132-134	1.90	2.73	40.41	1.10	52.45									1506	2.85
134-136	1.86	2.73	36.65	1.00	50.02									1497	2.79
136-138	1.92	2.73	36.05	0.98	49.60									1505	2.89
138-140	1.90	2.72	36.65	1.00	49.92									1499	2.84
140-142	1.92	2.74	36.89	1.01	50.27	19.7	28.4	24.0	27.9	4.5	5.15	0.03	0.66	1513	2.91
142-144	1.88	2.75	36.48	1.00	50.08									1523	2.86
144-146	1.92	2.74	37.78	1.04	50.86									1516	2.92
146-148	1.89	2.74	39.24	1.08	51.81									1546	2.92
148-150	1.90	2.74	43.26	1.19	54.24									1532	2.91
150-152	1.97	2.76	37.62	1.04	50.94	24.6	32.8	21.5	21.2	3.3	4.98	0.32	0.74	1558	3.07
152-154	1.93	2.76	36.28	1.00	50.03										
154-156	1.89	2.75	33.89	0.93	48.24										
156-158	1.90	2.75	36.38	1.00	50.01										

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
158-160	1.92	2.75	33.06	0.91	47.62										
160-162	1.90	2.75	32.06	0.88	46.86	31.1	27.9	21.8	19.1	3.0	4.9	0.34	0.7		
162-164	1.89	2.76	30.70	0.85	45.87										
164-166	1.97	2.75	26.55	0.73	42.20										
166-168	1.99	2.76	25.42	0.70	41.23										
168-170	1.98	2.75	27.82	0.76	43.34										
MEAN	1.84	2.73	38.34	1.04	50.87	15.4	19.8	38.3	26.4	4.9	4.62	0.06	0.93	1519	2.82

KW-PE-GC-241

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance (g/cm²s x 10⁵)
0-2	1.76	2.60	37.72	0.98	49.51	14.1	31.1	39.6	15.1	3.8	4.19	-0.06	0.99	1556	2.80
2-4	1.80	2.71	34.61	0.94	48.40									1553	2.95
4-6	1.90	2.71	30.96	0.84	45.62									1557	2.91
6-8	1.87	2.73	31.47	0.86	46.21									1557	2.83
8-10	1.82	2.71	35.41	0.96	48.97									1551	2.90
10-12	1.87	2.70	34.25	0.92	48.05	4.5	37.0	40.1	18.4	4.5	4	0.04	0.9	1536	2.92
12-14	1.90	2.70	37.80	1.02	50.51									1543	2.81
14-16	1.82	2.72	37.78	1.03	50.68									1536	2.76
16-18	1.79	2.72	37.48	1.02	50.48									1541	2.77
18-20	1.80	2.72	37.26	1.01	50.33									1602	2.99
20-22	1.86	2.72	38.00	1.03	50.83	8.2	28.1	40.2	23.6	4.9	4.45	0.03	0.87	1546	2.81
22-24	1.82													1546	2.82
24-26	1.83													1559	2.87
26-28	1.84														
28-30	1.85													1521	2.73
30-32	1.80													1535	2.88
32-34	1.88													1524	2.85
34-36	1.87													1522	2.84
36-38	1.87														
38-40	1.92													1523	2.82
40-42	1.85													1514	2.73
42-44	1.80													1506	2.72
44-46	1.81													1517	2.80
46-48	1.85													1536	2.88
48-50	1.88													1530	2.89
50-52	1.89													1524	2.88
52-54	1.89													1534	2.87
54-56	1.87													1520	2.84
56-58	1.87													1516	2.81
58-60	1.86													1497	2.77
60-62	1.85													1533	2.84
62-64	1.85													1505	2.76
64-66	1.83													1504	2.72
66-68	1.81													1493	2.64
68-70	1.77													1508	2.72
70-72	1.80													1507	2.69
72-74	1.79													1494	2.63
74-76	1.76													1487	2.59

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
76-78	1.74													1491	2.56
78-80	1.72													1491	2.59
80-82	1.74													1500	2.63
82-84	1.75													1490	2.62
84-86	1.76													1505	2.73
86-88	1.82													1505	2.64
88-90	1.75														
90-92	1.74													1497	2.75
92-95	1.84														
95-98	1.88														
98-100	1.77														
100-102	1.86														
102-104	1.90														
104-106	1.88														
106-108	1.92														
108-110	1.88														
110-112	1.82														
112-114	1.87														
114-116	1.85														
116-118	1.75														
118-120	1.82														
120-122	1.76														
122-124	1.74														
124-126	1.77														
126-128	1.68														
128-130	1.94														
130-132	1.89														
132-134	1.88														
134-136	1.90														
136-138	1.86														
138-140	1.82														
140-142	1.85													1492	2.84
142-144	1.90													1488	2.80
144-146	1.88													1488	2.77
146-148	1.86													1481	2.73
148-150	1.85													1506	2.87
150-152	1.91													1509	2.90
152-154	1.92													1509	2.97
154-156	1.97													1526	2.99
156-158	1.96													1532	2.99

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content meas.	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Sorting	Skewness	Kurtosis	Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
158-160	1.95													1537	3.10
160-162	2.01													1524	3.03
162-164	1.99													1527	2.79
164-166	1.83													1521	2.95
166-168	1.94													1528	2.96
168-170	1.94													1500	2.87
170-172	1.91													1521	3.00
172-174	1.97													1541	3.06
174-176	1.99														
176-178	1.93														
MEAN	1.85	2.70	35.70	0.97	49.05	8.9	32.1	40.0	19.0	4.4	4.21	0.00	0.92	1521	2.82

3.2.1.4 Lower Tampa Bay Physical and Geoacoustic Property Data:

LTB1-1
LTB1-3
LTB2-1
LTB2-3
LTB3-1
LTB3-3
LTB4-1
LTB4-3

Cruise: Lower Tampa Bay **Station: LTB1-1**
lat: 27 33.49 N **long: 82 41.16 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.86	2.65	31.85	0.84	45.77	2.8	89.2	10.8	2.4
2-4	2.05	2.68	27.80	0.75	42.70				
4-6	2.05	2.67	28.01	0.75	42.79				
6-8	1.92	2.67	30.97	0.83	45.26				
8-10	1.96	2.62	30.06	0.79	44.06				
10-12	1.97	2.63	30.00	0.79	44.10				
12-14	2.02	2.62	26.71	0.70	41.17	1.4	86.7	13.3	2.6

Cruise: Lower Tampa Bay **Station: LTB1-3**
lat: 27 33.49 N **long: 82 41.16 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.95	2.64	32.07	0.85	45.85	3.4	89.3	7.3	2.2
2-4	1.97	2.67	30.15	0.81	44.60				
4-6	1.96	2.62	30.40	0.80	44.33				
6-8	1.99	2.63	21.56	0.57	36.18				
8-10	1.98	2.60	30.93	0.80	44.58				
10-12	2.00	2.61	30.27	0.79	44.14	0.7	87.6	11.6	2.8
12-14	1.98	2.60	32.38	0.84	45.71				
14-16	1.96	2.61	33.27	0.87	46.47				
16-18	1.99	2.63	30.43	0.80	44.46				
18-20	2.05	2.64	24.56	0.65	39.34				
20-22	2.08	2.65	23.69	0.63	38.57	5.4	86.2	8.4	2.1
22-24	1.99	2.66	24.87	0.66	39.82				
24-26	2.01	2.63	2.17	0.06	5.41				

Cruise: Lower Tampa Bay
lat: 27 32.99 N

Station: LTB2-1
long: 82 41.20

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.92	2.63	34.12	0.90	47.29	0.6	94.4	5.6	2.9
2-4	1.97	2.65	63.27	1.68	62.64				
4-6	1.98	2.63	29.82	0.78	43.95				
6-8	1.96	2.63	29.39	0.77	43.60				
8-10	2.01	2.61	28.36	0.74	42.53				
10-12	2.01	2.62	27.42	0.72	41.81				
12-14	2.03	2.62	25.91	0.68	40.44				
14-16	2.03	2.67	23.19	0.62	38.24	2.0	91.9	8.1	2.6

Cruise: Lower Tampa Bay
lat: 27 32.99 N

Station: LTB2-3
long: 82 41.20 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.97	2.64	30.73	0.81	44.79	0.5	94.6	5.4	2.7
2-4	2.01	2.63	27.90	0.73	42.32				
4-6	2.02	2.64	29.09	0.77	43.44				
6-8	2.00	2.63	29.25	0.77	43.48				
8-10	1.99	2.63	30.32	0.80	44.37				
10-12	1.96	2.64	28.47	0.75	42.91				
12-14	2.04	2.64	27.03	0.71	41.64				
14-16	2.04	2.64	27.09	0.72	41.70	0.2	95.9	4.1	2.8

Cruise: Lower Tampa Bay **Station: LTB3-1**
lat: 27 33.00 N **long: 82 40.50 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.96	2.64	32.12	0.85	45.89	0.0	95.1	4.9	2.6
2-4	1.97	2.63	31.45	0.83	45.27				
4-6	1.99	2.62	35.97	0.94	48.52				
6-8	2.02	2.63	27.06	0.71	41.58				
8-10	2.03	2.63	24.51	0.64	39.20				
10-12	2.01	2.65	25.86	0.69	40.66				
12-14	2.00	2.65	27.03	0.72	41.73				
14-16	2.02	2.65	24.02	0.64	38.89	1.8	91.0	8.9	2.6

Cruise: Lower Tampa Bay **Station: LTB3-3**
lat: 27 33.00 N **long: 82 40.50 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.06	2.63	27.92	0.73	42.34	0.0	95.7	4.3	2.7
2-4	2.02	2.66	25.05	0.67	39.99				
4-6	2.05	2.63	24.57	0.65	39.25				
6-8	1.93	2.64	28.33	0.75	42.78				
8-10	1.93	2.64	26.30	0.69	40.98				
10-12	2.03	2.63	15.53	0.41	29.00	0.5	93.8	6.2	2.6
12-14	2.04	2.62	27.79	0.73	42.13				
14-16	2.04	2.63	25.58	0.67	40.22				
16-18	2.03	2.65	25.23	0.67	40.07				
18-2	2.03	2.65	26.06	0.69	40.85				
20-22	2.05	2.63	26.55	0.70	41.11	1.3	89.7	10.3	2.6
22-24	2.00	2.64	27.76	0.73	42.29				
24-26	2.02	2.64	24.67	0.65	39.44				
26-28	2.06	2.64	25.79	0.68	40.51				
28-30	2.05	2.64	24.73	0.65	39.50				
30-32	2.08	2.65	25.78	0.68	40.59	1.7	92.6	7.4	2.6
32-34	2.07	2.64	25.43	0.67	40.17				

Cruise :Lower Tampa Bay Station: LTB4-1
lat: 27 32.99 N long: 82 40.00 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.00	2.64	28.47	0.75	42.91				
2-4	1.93	2.63	31.72	0.83	45.48				
4-6	1.96	2.63	29.73	0.78	43.88				
6-8	2.02	2.65	28.36	0.75	42.91				
8-10	2.00	2.65	27.57	0.73	42.22				
10-12	2.01	2.64	28.56	0.75	42.99				
12-14	2.01	2.64	27.87	0.74	42.39				
14-16	2.07	2.67	22.86	0.61	37.90	1.8	88.6	11.4	1.2

Cruise: Lower Tampa Bay Station: LTB4-3
lat: 27 32.99 N long: 82 40.00 W

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	1.82	2.62	45.44	1.19	54.35	0.2	91.8	8.2	2.9
2-4	1.94	2.64	32.59	0.86	46.25				
4-6	1.94	2.63	31.86	0.84	45.59				
6-8	1.94	2.63	37.17	0.98	49.43				
8-10	1.88	2.63	38.10	1.00	50.05				
10-12	1.98	2.66	32.70	0.87	46.52	2.6	86.8	13.1	
12-14	1.99	2.69	28.39	0.76	43.30				
14-16	2.07	2.66	27.49	0.73	42.24				
16-18	2.03	2.67	29.43	0.79	44.01	8.4	84.7	15.3	2.7

3.2.1.5 Indian Rocks Beach Physical and Geoacoustic Property Data:

IRB5-1
IRB5-3
IRB6-1
IRB6-3

Cruise: Indian Rocks Beach **Station: IRB5-1**
lat: 27 55.96 N **long: 82 52.65 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.05	2.68	24.69	0.66	39.80	0.0	98.4	0.0	2.4
2-4	2.04	2.67	22.82	0.61	37.90				
4-6	2.07	2.68	22.44	0.60	37.59				
6-8	2.06	2.68	22.27	0.60	37.35				
8-10	2.10	2.68	24.89	0.67	40.04	0.0	100.0	0.0	2.2

Cruise: Indian Rocks Beach **Station: IRB5-3**
lat: 27 55.96 N **long: 82 52.65 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.05	2.91	22.17	0.65	39.23	0.4	99.3	0.0	2.2
2-4	2.07	2.66	22.11	0.59	37.06				
4-6	2.05	2.68	22.85	0.61	37.96				
6-8	2.07	2.67	24.02	0.64	39.06				
8-10	2.05	2.67	24.83	0.66	39.82				
10-12	2.08	2.70	23.61	0.64	38.88	0.3	99.3	0.0	2.1
12-14	2.07	2.67	24.17	0.65	39.26				
14-16	2.07	2.70	25.88	0.70	41.09				
16-18	2.09	2.65	22.72	0.60	37.62	0.5	97.1	0.0	2.1

Cruise: Indian Rocks Beach **Station: IRB6-1**
lat: 27 56.341 N **long: 82 54.47 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.02	2.69	25.15	0.68	40.38	0.4	98.3	0.1	2.4
2-4	2.04	2.72	25.54	0.69	40.95				
4-6	2.07	2.69	24.13	0.65	39.33				
6-8	2.06	2.69	24.95	0.67	40.18				
8-10	2.05	2.70	25.09	0.68	40.34				
10-12	2.07	2.73	21.89	0.60	37.44	11.7	86.6	0.0	1.0
12-14	1.99	2.72	27.15	0.74	42.50				
14-16	2.08	2.76	21.13	0.58	36.87	19.6	79.3	0.0	0.7

Cruise: Indian Rocks Beach **Station: IRB6-3**
lat: 27 56.34 N **long: 82 54.47 W**

Depth Interval (cm)	Wet Bulk Density (g/cm^3)	Grain Density (g/cm^3)	Water Content %	Void Ratio	Porosity %	Gravel %	Sand %	Silt+Clay %	Mean Grain Size (Phi)
0-2	2.04	2.73	25.89	0.71	41.43	6.6	92.8	0.0	1.4
2-4	2.06	2.73	25.09	0.68	40.61				
4-6	2.09	2.93	24.77	0.73	42.05				
6-8	2.03	2.68	26.87	0.72	41.89				
8-10	2.05	2.68	26.15	0.70	41.19				
10-12	2.02	2.54	26.39	0.67	40.12				
12-14	2.03	2.72	25.71	0.70	41.13	4.9	94.9	0.0	1.6

3.2.2 Core Logger Data:

Section 3.2.2 is divided into two subsections for the Dry Tortugas test site, 3.2.2.1, and the Marquesas Keys test site, 3.2.2.2.

The column labeled boyce corrected gamma density is the core logger-measured wet bulk density values. The column labeled pycnometer cal. Boyce corr. den. contains the core logger-measured wet bulk density values calibrated with pycnometer measured wet bulk density values. The column labeled 20 deg.C Vpcontains the compressional wave velocity corrected to in situ temperature (20°C), pressure, and depth.

3.2.2.1 Dry Tortugas Core Logger Data: KW-PE-GC-146

KW-PE-GC-157
KW-PE-GC-158
KW-PE-GC-177
KW-PE-GC-179
KW-PE-GC-180
KW-PE-GC-204
KW-PE-GC-206
KW-PE-GC-214
KW-PE-GC-215
KW-PE-GC-229
KW-PE-GC-231
KW-PE-GC-233
KW-PE-GC-283
KW-PE-GC-313

KW-PE-GC-146

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.77	1.71	1566	2.68
2.0	1.75	1.69	1586	2.69
4.0	1.71	1.65		
6.0	1.53	1.47	1579	2.32
8.0	1.19	1.13	1579	1.79
10.0	1.54	1.48	1572	2.33
12.0	1.73	1.67	1567	2.61
14.0	1.72	1.67	1557	2.60
16.0	1.79	1.73	1565	2.71
18.0	1.80	1.74	1562	2.72
20.0	1.81	1.75	1564	2.74
22.0	1.67	1.62	1563	2.53
24.0	1.78	1.73	1558	2.69
26.0	1.89	1.83	1561	2.86
28.0	1.77	1.71	1566	2.68
30.0	1.86	1.80	1561	2.82
32.0	1.89	1.84	1563	2.87
34.0	1.93	1.87	1564	2.93
36.0	1.89	1.84	1559	2.87
38.0	1.91	1.86	1566	2.91
40.0	1.91	1.85	1558	2.88
42.0	1.89	1.83	1555	2.85
44.0	1.90	1.85	1548	2.86
46.0	1.89	1.84		
48.0	1.88	1.83		
50.0	1.88	1.82		
52.0	1.90	1.84		
54.0	1.90	1.85	1516	2.80
56.0	1.92	1.86	1563	2.90
58.0	1.91	1.86	1568	2.91
60.0	1.89	1.83	1571	2.88
62.0	1.90	1.84	1570	2.90
64.0	1.91	1.86	1580	2.93
66.0	1.93	1.87	1586	2.96
68.0	1.91	1.85	1571	2.91
70.0	1.92	1.87	1552	2.90
72.0	1.92	1.86	1562	2.91
74.0	1.91	1.86	1575	2.93
76.0	1.91	1.86	1578	2.93
78.0	1.90	1.84	1583	2.91
80.0	1.89	1.83	1596	2.93
82.0	1.89	1.83	1590	2.92
84.0	1.86	1.80	1585	2.85

KW-PE-GC-157

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.72	1.67		
2.0	1.84	1.79	1536	2.74
4.0	1.82	1.77	1525	2.69
6.0	1.83	1.77	1519	2.69
8.0	1.83	1.77	1518	2.69
10.0	1.81	1.75	1512	2.65
12.0	1.85	1.79	1516	2.71
14.0	1.84	1.79	1516	2.71
16.0	1.86	1.80	1519	2.73
18.0	1.86	1.80	1514	2.72
20.0	1.86	1.80	1516	2.73
22.0	1.85	1.80	1512	2.72
24.0	1.88	1.82	1523	2.77
26.0	1.88	1.82	1520	2.77
28.0	1.92	1.87	1529	2.85
30.0	1.92	1.86	1529	2.84
32.0	1.96	1.90	1517	2.89
34.0	1.93	1.87	1526	2.85
36.0	1.93	1.87	1528	2.86
38.0	1.94	1.88	1527	2.88
40.0	1.92	1.86	1518	2.82
42.0	1.92	1.86	1515	2.82
44.0	1.92	1.87	1518	2.83
46.0	1.93	1.87	1516	2.84
48.0	1.93	1.87	1520	2.85
50.0	1.93	1.88	1522	2.85
52.0	1.93	1.87	1525	2.85
54.0	1.94	1.88	1527	2.88
56.0	1.91	1.85	1523	2.82
58.0	1.91	1.85	1520	2.81
60.0	1.92	1.86	1517	2.83
62.0	1.90	1.84	1517	2.79
64.0	1.91	1.85	1525	2.83
66.0	1.93	1.87	1528	2.86
68.0	1.90	1.84	1529	2.82
70.0	1.90	1.85	1527	2.82
72.0	1.91	1.85	1533	2.84
74.0	1.92	1.86	1531	2.85
76.0	1.88	1.82	1531	2.79
78.0	1.93	1.87	1539	2.89
80.0	1.92	1.86	1538	2.86
82.0	1.93	1.87	1544	2.89
84.0	1.93	1.87	1546	2.89
86.0	1.92	1.86	1544	2.88
88.0	1.90	1.85	1538	2.84
90.0	1.88	1.82		
92.0	1.93	1.87		
94.0	2.02	1.96		
96.0	1.93	1.87		
98.0	1.89	1.84		
100.0	1.88	1.83		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
102.0	1.88	1.82	1586	2.89
104.0	1.90	1.84	1593	2.93
106.0	1.90	1.84	1583	2.92
108.0	1.95	1.89	1588	3.01
110.0	1.89	1.83	1561	2.85
112.0	1.88	1.83	1576	2.88
114.0	1.90	1.84	1585	2.92
116.0	1.90	1.85	1584	2.93
118.0	1.92	1.87	1529	2.85
120.0	1.90	1.84	1584	2.91
122.0	1.93	1.88	1607	3.01
124.0	1.92	1.86	1622	3.02
126.0	1.92	1.86	1585	2.95
128.0	1.90	1.85	1595	2.94
130.0	1.91	1.85	1590	2.94
132.0	1.90	1.84	1587	2.92
134.0	1.89	1.84	1584	2.91
136.0	1.92	1.87	1586	2.96
138.0	1.91	1.85	1599	2.95
140.0	1.91	1.85	1599	2.96
142.0	1.92	1.86	1448	2.69
144.0	1.90	1.84	1591	2.94
146.0	1.93	1.88	1582	2.97
148.0	1.95	1.90	1606	3.05
150.0	1.94	1.88	1587	2.98
152.0	1.94	1.88	1587	2.98
154.0	1.94	1.89	1587	3.00
156.0	1.92	1.86	1581	2.95
158.0	1.89	1.84	1568	2.88
160.0	1.91	1.86	1576	2.93
162.0	1.85	1.79	1558	2.79
164.0	1.90	1.84	1568	2.89
166.0	1.92	1.86	1576	2.93
168.0	1.90	1.84	1581	2.91
170.0	1.93	1.87	1586	2.97
172.0	1.92	1.87	1580	2.95
174.0	1.91	1.85	1574	2.92
176.0	1.95	1.89	1580	2.99
178.0	1.91	1.86	1567	2.91
180.0	1.95	1.89	1587	3.01
182.0	1.92	1.87	1571	2.93
184.0	1.90	1.85	1577	2.91
186.0	1.96	1.91	1589	3.03
188.0	1.96	1.90	1589	3.02
190.0	1.93	1.87	1582	2.96
192.0	1.94	1.88	1579	2.98
194.0	1.91	1.86	1565	2.90
196.0	1.92	1.86	1573	2.92
198.0	1.90	1.84	1559	2.87
200.0	1.88	1.83	1568	2.86
202.0	1.90	1.85	1566	2.89
204.0	1.92	1.86	1577	2.93
206.0	1.91	1.85	1568	2.90
208.0	1.87	1.81	1566	2.84

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
210.0	1.91	1.85	1569	2.91
212.0	1.91	1.86	1579	2.93

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.87	1.81		
2.0	1.81	1.75	1512	2.65
4.0	1.83	1.77		
6.0	1.83	1.77	1525	2.70
8.0	1.83	1.78	1532	2.72
10.0	1.84	1.78	1530	2.73
12.0	1.84	1.78	1530	2.73
14.0	1.85	1.79	1534	2.75
16.0	1.86	1.80	1537	2.77
18.0	1.87	1.82	1542	2.80
20.0	1.86	1.80	1548	2.78
22.0	1.88	1.82	1550	2.83
24.0	1.90	1.84	1552	2.86
26.0	1.87	1.81	1549	2.81
28.0	1.89	1.84	1548	2.84
30.0	1.89	1.83	1558	2.86
32.0	1.88	1.82	1559	2.84
34.0	1.88	1.82	1556	2.83
36.0	1.89	1.84	1552	2.85
38.0	1.89	1.83	1560	2.85
40.0	1.85	1.80	1547	2.78
42.0	1.90	1.84	1549	2.85
44.0	1.89	1.84	1553	2.85
46.0	1.88	1.83	1557	2.85
48.0	1.88	1.83	1554	2.84
50.0	1.90	1.84	1549	2.85
52.0	1.88	1.83	1553	2.84
54.0	1.90	1.85	1550	2.86
56.0	1.90	1.84	1548	2.85
58.0	1.89	1.83	1553	2.85
60.0	1.88	1.82	1547	2.82
62.0	1.91	1.85	1558	2.89
64.0	1.90	1.84	1552	2.86
66.0	1.90	1.84	1550	2.86
68.0	1.89	1.83	1551	2.84
70.0	1.90	1.85	1551	2.86
72.0	1.89	1.83	1555	2.84
74.0	1.89	1.83	1548	2.83
76.0	1.90	1.84	1545	2.85
78.0	1.91	1.85	1550	2.87
80.0	1.92	1.86	1558	2.90
82.0	1.91	1.86	1562	2.90
84.0	1.91	1.85	1554	2.88
86.0	1.93	1.87	1553	2.90
88.0	1.92	1.86	1557	2.90
90.0	1.92	1.86	1555	2.89
92.0	1.90	1.84	1559	2.87
94.0	1.99	1.94		
96.0	2.01	1.95		
98.0	1.96	1.91		
100.0	1.88	1.83		
102.0	1.90	1.85		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.96	1.90		
106.0	1.97	1.91	1582	3.02
108.0	1.85	1.79	1574	2.82
110.0	1.83	1.77	1575	2.79
112.0	1.79	1.74		
114.0	1.79	1.73	1503	2.60
116.0	1.97	1.91	1589	3.04
118.0	1.96	1.90	1602	3.04
120.0	1.90	1.84	1596	2.94
122.0	1.92	1.86	1573	2.93
124.0	1.90	1.84	1572	2.90
126.0	1.89	1.83	1571	2.88
128.0	1.94	1.89	1566	2.96
130.0	1.92	1.87	1580	2.95
132.0	1.94	1.88	1582	2.97
134.0	1.92	1.86	1582	2.95
136.0	1.93	1.87	1571	2.94
138.0	1.93	1.87	1572	2.95
140.0	1.93	1.88	1576	2.96
142.0	1.95	1.90	1574	2.99
144.0	1.95	1.89	1572	2.97
146.0	1.94	1.88	1576	2.96
148.0	1.92	1.86	1568	2.92
150.0	1.86	1.81	1586	2.87
152.0	1.92	1.87		
154.0	1.91	1.86	1549	2.88
156.0	1.91	1.86	1558	2.89
158.0	1.94	1.89	1546	2.92
160.0	1.87	1.81	1551	2.81
162.0	1.93	1.88	1557	2.92
164.0	1.89	1.83	1552	2.84
166.0	1.87	1.81	1543	2.80
168.0	1.83	1.78	1532	2.72
170.0	1.82	1.76		

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Depth (cm)	Boyce corrected gamma density (g/cm³)	Pycnometer cal. Boyce corr. den. (g/cm³)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.74	1.68	1552	2.61
2.0	1.81	1.76	1563	2.75
4.0	1.80	1.74		
6.0	1.79	1.74		
8.0	1.79	1.73		
10.0	1.78	1.72		
12.0	1.79	1.73	1589	2.76
14.0	1.81	1.76	1533	2.69
16.0	1.82	1.77	1532	2.71
18.0	1.80	1.75	1533	2.68
20.0	1.83	1.77	1535	2.72
22.0	1.80	1.75	1533	2.68
24.0	1.84	1.78	1545	2.75
26.0	1.85	1.80	1541	2.77
28.0	1.85	1.79	1545	2.77
30.0	1.86	1.80	1556	2.80
32.0	1.84	1.79	1551	2.77
34.0	1.84	1.79	1552	2.77
36.0	1.85	1.79	1552	2.78
38.0	1.86	1.80	1558	2.80
40.0	1.88	1.83	1558	2.84
42.0	1.87	1.81	1549	2.80
44.0	1.82	1.76	1542	2.72
46.0	1.83	1.78	1547	2.75
48.0	1.84	1.78	1547	2.75
50.0	1.86	1.80	1552	2.80
52.0	1.85	1.79	1553	2.78
54.0	1.86	1.81	1550	2.80
56.0	1.86	1.81	1547	2.79
58.0	1.84	1.79	1548	2.76
60.0	1.85	1.80	1550	2.78
62.0	1.84	1.78	1547	2.76
64.0	1.86	1.80	1557	2.80
66.0	1.87	1.81	1560	2.83
68.0	1.88	1.82	1554	2.83
70.0	1.88	1.82	1558	2.84
72.0	1.86	1.80	1558	2.81
74.0	1.86	1.80	1552	2.80
76.0	1.85	1.80	1552	2.79
78.0	1.85	1.79	1551	2.77
80.0	1.86	1.80	1551	2.80
82.0	1.87	1.81	1554	2.81
84.0	1.86	1.80	1549	2.79
86.0	1.85	1.79	1543	2.76
88.0	1.84	1.79	1534	2.74
90.0	1.94	1.88		
92.0	1.93	1.87		
94.0	1.92	1.86		
96.0	1.94	1.88	1552	2.92
98.0	1.92	1.86	1548	2.88
100.0	1.94	1.88	1546	2.90
102.0	1.94	1.88	1553	2.93

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.93	1.87	1548	2.90
106.0	1.97	1.91	1559	2.98
108.0	1.94	1.88	1553	2.92
110.0	1.96	1.90	1564	2.97
112.0	1.98	1.93	1568	3.02
114.0	1.96	1.90	1555	2.96
116.0	1.96	1.90	1554	2.96
118.0	1.94	1.89	1562	2.95
120.0	1.97	1.91	1569	3.00
122.0	2.00	1.94	1563	3.03
124.0	1.96	1.91	1554	2.96
126.0	1.98	1.92	1559	2.99
128.0	1.96	1.90	1552	2.95
130.0	1.97	1.91	1566	3.00
132.0	1.94	1.88	1557	2.92
134.0	1.97	1.91	1564	2.98
136.0	1.99	1.93	1574	3.04
138.0	1.98	1.93	1576	3.04
140.0	1.92	1.87	1579	2.95

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.70	1.65	1511	2.49
2.0	1.77	1.72	1526	2.62
4.0	1.80	1.74	1537	2.67
6.0	1.81	1.76	1542	2.71
8.0	1.82	1.77	1548	2.74
10.0	1.82	1.76	1553	2.73
12.0	1.82	1.76	1553	2.74
14.0	1.82	1.76	1561	2.75
16.0	1.83	1.77	1556	2.75
18.0	1.84	1.79	1556	2.78
20.0	1.83	1.78	1558	2.77
22.0	1.85	1.79	1553	2.78
24.0	1.82	1.76	1555	2.74
26.0	1.86	1.81	1558	2.81
28.0	1.83	1.78	1561	2.77
30.0	1.82	1.76	1557	2.75
32.0	1.83	1.77	1556	2.75
34.0	1.84	1.78	1555	2.77
36.0	1.89	1.83	1556	2.85
38.0	1.86	1.80	1561	2.81
40.0	1.84	1.78	1559	2.78
42.0	1.83	1.78	1562	2.77
44.0	1.86	1.81	1560	2.82
46.0	1.87	1.81	1557	2.82
48.0	1.87	1.81	1562	2.83
50.0	1.87	1.81	1557	2.82
52.0	1.87	1.81	1562	2.83
54.0	1.86	1.81	1562	2.82
56.0	1.87	1.81	1562	2.83
58.0	1.90	1.84	1565	2.88
60.0	1.88	1.83	1563	2.85
62.0	1.87	1.81	1569	2.84
64.0	1.87	1.81	1567	2.84
66.0	1.86	1.80	1564	2.82
68.0	1.86	1.80	1566	2.82
70.0	1.87	1.82	1561	2.83
72.0	1.87	1.81	1563	2.83
74.0	1.86	1.80	1565	2.81
76.0	1.89	1.84	1565	2.87
78.0	1.88	1.83	1565	2.86
80.0	1.86	1.80	1564	2.82
82.0	1.94	1.89	1562	2.95

KW-PE-GC-180

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	0.92	0.86		
2.0	1.49	1.43		
4.0	1.47	1.41		
6.0	1.53	1.48		
8.0	1.71	1.65		
10.0	1.67	1.62	1522	2.46
12.0	1.72	1.66		
14.0	1.72	1.67		
16.0	1.79	1.73		
18.0	1.71	1.65		
20.0	1.76	1.70		
22.0	1.76	1.70		
24.0	1.74	1.68	1522	2.56
26.0	1.77	1.72		
28.0	1.78	1.72		
30.0	1.77	1.71	1544	2.65
32.0	1.77	1.71	1546	2.64
34.0	1.80	1.74	1538	2.68
36.0	1.80	1.74	1546	2.69
38.0	1.80	1.74	1547	2.69
40.0	1.84	1.78	1548	2.75
42.0	1.84	1.78	1547	2.75
44.0	1.86	1.80	1544	2.78
46.0	1.88	1.82	1533	2.80
48.0	1.86	1.81	1528	2.76
50.0	1.87	1.81	1531	2.77
52.0	1.88	1.82	1530	2.78
54.0	1.88	1.82	1530	2.78
56.0	1.88	1.82	1530	2.79
58.0	1.88	1.82	1533	2.79
60.0	1.88	1.82	1532	2.79
62.0	1.86	1.80	1532	2.76
64.0	1.86	1.80	1531	2.76
66.0	1.87	1.81	1532	2.78
68.0	1.88	1.83	1529	2.79
70.0	1.87	1.81	1531	2.77
72.0	1.86	1.81	1531	2.77
74.0	1.89	1.83	1536	2.81
76.0	1.88	1.82	1534	2.79
78.0	1.89	1.83		
80.0	1.86	1.80	1515	2.73
82.0	1.89	1.83		
84.0	1.88	1.83		
86.0	1.87	1.81		
88.0	1.88	1.82		
90.0	1.90	1.84	1538	2.83
92.0	1.90	1.85	1534	2.83
94.0	1.88	1.82		
96.0	1.88	1.83	1540	2.81
98.0	1.89	1.83	1548	2.84
100.0	1.86	1.80	1542	2.78

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
102.0	1.89	1.83	1540	2.82
104.0	1.91	1.85	1545	2.86
106.0	1.90	1.84	1537	2.83
108.0	1.88	1.82	1546	2.82
110.0	1.86	1.81	1548	2.80
112.0	1.89	1.83	1543	2.82
114.0	1.89	1.83	1546	2.83
116.0	1.89	1.84	1539	2.83
118.0	1.90	1.85	1533	2.83
120.0	1.90	1.84	1535	2.83
122.0	1.91	1.85	1554	2.87
124.0	1.90	1.84	1557	2.87
126.0	1.92	1.86	1554	2.89
128.0	1.89	1.83	1546	2.83
130.0	1.94	1.88	1557	2.93
132.0	2.00	1.95	1553	3.03
134.0	1.92	1.87	1561	2.91
136.0	1.95	1.90	1561	2.96
138.0	1.92	1.86	1579	2.94
140.0	1.91	1.85	1558	2.88
142.0	1.91	1.85	1564	2.90
144.0	1.94	1.88	1559	2.93
146.0	1.95	1.89	1568	2.96
148.0	1.93	1.87	1563	2.92
150.0	1.92	1.86	1553	2.89
152.0	1.94	1.88	1564	2.94
154.0	1.94	1.89	1558	2.94
156.0	1.94	1.88	1563	2.95
158.0	1.95	1.89	1563	2.95
160.0	1.94	1.88	1561	2.94
162.0	1.94	1.88	1568	2.95
164.0	1.93	1.87	1561	2.92
166.0	1.89	1.83	1568	2.88
168.0	1.96	1.90	1566	2.97
170.0	2.00	1.94	1568	3.04
172.0	1.97	1.91	1566	2.99
174.0	1.96	1.90	1571	2.99
176.0	1.97	1.91	1573	3.01
178.0	1.94	1.89	1562	2.95
180.0	1.94	1.89	1560	2.94
182.0	1.97	1.91	1569	3.00
184.0	1.96	1.90		
186.0	1.97	1.91		
188.0	2.00	1.95	1531	2.98
190.0	1.95	1.89		
192.0	1.97	1.91	1552	2.97
194.0	1.96	1.90	1549	2.94
196.0	1.95	1.89	1548	2.92
198.0	1.97	1.91	1549	2.96
200.0	1.97	1.91	1544	2.95
202.0	1.97	1.92	1548	2.97
204.0	1.95	1.90	1553	2.95
206.0	1.98	1.92	1556	2.99
208.0	1.99	1.93	1553	3.00

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
210.0	2.00	1.94	1542	2.99
212.0	1.99	1.93	1550	2.99
214.0	1.98	1.93	1553	2.99
216.0	1.99	1.94	1553	3.01
218.0	2.02	1.96	1547	3.03
220.0	1.99	1.94	1549	3.00
222.0	1.97	1.92	1552	2.98
224.0	2.01	1.95	1554	3.03
226.0	1.97	1.91	1556	2.97
228.0	1.98	1.92	1554	2.98
230.0	1.97	1.92		

KW-PE-GC-204

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.67	1.62		
2.0	1.70	1.64		
4.0	1.73	1.68		
6.0	1.77	1.71		
8.0	1.80	1.75		
10.0	1.83	1.78	1508	2.68
12.0	1.83	1.77		
14.0	1.84	1.78	1530	2.73
16.0	1.84	1.78	1530	2.73
18.0	1.85	1.80	1529	2.75
20.0	1.87	1.81	1536	2.78
22.0	1.87	1.81	1542	2.79
24.0	1.83	1.77	1542	2.73
26.0	1.82	1.76	1542	2.72
28.0	1.88	1.82	1545	2.81
30.0	1.87	1.82	1547	2.81
32.0	1.89	1.83	1544	2.83
34.0	1.91	1.86	1545	2.87
36.0	1.86	1.80	1537	2.77
38.0	1.92	1.86	1547	2.88
40.0	1.91	1.85	1537	2.85
42.0	1.92	1.86	1534	2.85
44.0	1.91	1.86	1534	2.85
46.0	1.90	1.84	1530	2.82
48.0	1.90	1.84	1530	2.82
50.0	1.91	1.86	1534	2.85
52.0	1.92	1.86	1533	2.85
54.0	1.89	1.84	1525	2.80
56.0	1.92	1.86	1529	2.84
58.0	1.93	1.88	1532	2.87
60.0	1.91	1.86	1532	2.85
62.0	1.90	1.84	1530	2.82
64.0	1.92	1.87	1531	2.86
66.0	1.91	1.85	1535	2.85
68.0	1.91	1.86	1537	2.85
70.0	1.91	1.85	1531	2.83
72.0	1.93	1.87	1526	2.86
74.0	1.91	1.85	1530	2.83
76.0	1.92	1.86	1532	2.85
78.0	1.91	1.85	1527	2.82
80.0	1.97	1.91	1527	2.92
82.0	1.92	1.87	1537	2.87
84.0	1.95	1.89	1540	2.92
86.0	1.93	1.88	1537	2.88
88.0	1.90	1.85		
90.0	1.95	1.89	1507	2.85
92.0	1.72	1.66		
94.0	1.90	1.84		
96.0	1.89	1.83		
98.0	1.90	1.85		
100.0	1.92	1.86		
102.0	1.92	1.87		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.92	1.86		
106.0	1.91	1.85		
108.0	1.92	1.86		
110.0	1.88	1.83		
112.0	1.92	1.86		
114.0	1.95	1.89	1566	2.96
116.0	1.93	1.87	1578	2.95
118.0	1.97	1.91	1568	3.00
120.0	1.97	1.91	1577	3.01
122.0	1.96	1.90	1577	2.99
124.0	1.94	1.89	1585	2.99
126.0	1.97	1.91	1577	3.01
128.0	1.98	1.92	1566	3.01
130.0	1.96	1.90	1557	2.96
132.0	1.97	1.91	1569	3.00
134.0	1.97	1.91	1542	2.94
136.0	1.95	1.89	1553	2.94
138.0	1.99	1.93		0.00
140.0	1.99	1.94	1560	3.02
142.0	1.97	1.91	1559	2.98
144.0	1.95	1.89	1548	2.93
146.0	1.95	1.90	1552	2.94
148.0	1.98	1.92	1550	2.98
150.0	1.98	1.93	1547	2.98
152.0	1.98	1.92	1542	2.96
154.0	1.98	1.92	1550	2.98
156.0	1.97	1.91	1557	2.97
158.0	1.98	1.92	1557	2.99
160.0	1.98	1.92	1567	3.01
162.0	1.98	1.93	1571	3.02
164.0	1.96	1.91	1564	2.98
166.0	1.97	1.91	1558	2.98
168.0	1.97	1.91	1555	2.97
170.0	1.96	1.91	1560	2.97
172.0	1.98	1.92	1572	3.02
174.0	2.03	1.97	1593	3.14
176.0	1.85	1.79		

KW-PE-GC-206

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)
0.0	1.23	1.17
2.0	1.25	1.19
4.0	1.27	1.21
6.0	1.30	1.25
8.0	1.29	1.23
10.0	1.38	1.32
12.0	1.49	1.43
14.0	1.63	1.57
16.0	1.71	1.65
18.0	1.79	1.73
20.0	1.82	1.76
22.0	1.85	1.79
24.0	1.88	1.83
26.0	1.90	1.85
28.0	1.88	1.83
30.0	1.91	1.86
32.0	1.95	1.90
34.0	1.93	1.87
36.0	1.92	1.86
38.0	1.93	1.87
40.0	1.92	1.86
42.0	1.95	1.89
44.0	1.96	1.91
46.0	1.94	1.89
48.0	1.96	1.90
50.0	1.94	1.88
52.0	1.95	1.89
54.0	1.97	1.91
56.0	1.96	1.90
58.0	1.94	1.88
60.0	1.93	1.87
62.0	1.97	1.91
64.0	1.95	1.89
66.0	1.95	1.89
68.0	1.95	1.89
70.0	1.95	1.89
72.0	1.96	1.91
74.0	1.97	1.91
76.0	1.99	1.93
78.0	1.97	1.91
80.0	1.99	1.93
82.0	1.98	1.92
84.0	1.96	1.90
86.0	2.07	2.01
88.0	2.10	2.04
90.0	1.96	1.91
92.0	1.90	1.84
94.0	1.89	1.84
96.0	1.88	1.83
98.0	1.89	1.83
100.0	1.92	1.86
102.0	1.92	1.86

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)
104.0	1.92	1.86
106.0	1.91	1.85
108.0	1.94	1.88
110.0	1.91	1.85
112.0	1.91	1.86
114.0	1.92	1.86
116.0	1.91	1.85
118.0	1.92	1.86
120.0	1.94	1.88
122.0	1.94	1.88
124.0	1.96	1.90
126.0	1.93	1.87
128.0	1.95	1.89
130.0	1.93	1.88
132.0	1.94	1.89
134.0	2.04	1.98
136.0	1.93	1.87
138.0	1.98	1.92
140.0	1.96	1.90
142.0	1.94	1.88
144.0	1.93	1.87
146.0	1.90	1.84
148.0	1.93	1.88
150.0	1.94	1.89
152.0	1.94	1.89
154.0	1.95	1.89
156.0	1.91	1.86
158.0	1.96	1.90
160.0	1.95	1.90
162.0	1.93	1.87
164.0	1.95	1.89
166.0	1.96	1.90
168.0	1.93	1.87
170.0	1.91	1.85
172.0	1.94	1.88
174.0	1.97	1.91
176.0	1.98	1.93
178.0	1.95	1.89
180.0	1.96	1.90

KW-PE-GC-214

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.77	1.72		
2.0	1.79	1.74		
4.0	1.81	1.75		
6.0	1.85	1.79		
8.0	1.88	1.82		
10.0	1.91	1.85		
12.0	1.92	1.86		
14.0	1.87	1.81		
16.0	1.86	1.80		
18.0	1.85	1.79		
20.0	1.86	1.80		
22.0	1.88	1.82		
24.0	1.88	1.83		
26.0	1.90	1.85		
28.0	1.92	1.87		
30.0	1.93	1.87		
32.0	1.90	1.85		
34.0	1.90	1.84		
36.0	1.91	1.85		
38.0	1.92	1.87	1522	2.84
40.0	1.93	1.87	1519	2.85
42.0	1.94	1.88	1516	2.85
44.0	1.94	1.88	1513	2.85
46.0	1.95	1.90	1515	2.87
48.0	1.91	1.85	1510	2.80
50.0	1.96	1.90	1518	2.88
52.0	1.92	1.86	1515	2.82
54.0	1.95	1.90	1513	2.87
56.0	1.92	1.87	1510	2.82
58.0	1.91	1.86	1510	2.80
60.0	1.95	1.89	1516	2.86
62.0	1.94	1.89	1521	2.87
64.0	1.95	1.89	1512	2.86
66.0	1.96	1.90	1515	2.88
68.0	1.95	1.89		
70.0	1.96	1.90		
72.0	1.96	1.90	1511	2.88
74.0	1.96	1.91	1507	2.87
76.0	1.98	1.92	1509	2.90
78.0	1.97	1.92		
80.0	2.07	2.01		
82.0	2.10	2.04		
84.0	1.84	1.78		
86.0	1.88	1.83		
88.0	1.89	1.84		
90.0	1.83	1.78		
92.0	1.87	1.82		
94.0	1.77	1.71		
96.0	1.81	1.76		
98.0	1.88	1.83		
100.0	1.86	1.81		
102.0	1.82	1.76	1533	2.70

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.84	1.78	1571	2.80
106.0	1.85	1.80	1604	2.88
108.0	1.88	1.83		
110.0	1.85	1.79	1590	2.85
112.0	1.83	1.77	1641	2.91
114.0	1.84	1.78	1641	2.92
116.0	1.88	1.83		
118.0	1.77	1.71		
120.0	1.82	1.76	1579	2.78
122.0	1.88	1.83	1578	2.88
124.0	1.95	1.89	1575	2.97
126.0	1.95	1.89	1595	3.01
128.0	1.94	1.88	1578	2.97
130.0	1.93	1.88	1575	2.96
132.0	1.89	1.84	1573	2.89
134.0	1.94	1.88	1581	2.98
136.0	1.91	1.86	1578	2.93
138.0	1.92	1.87	1577	2.94
140.0	1.91	1.85	1571	2.91
142.0	1.93	1.87	1578	2.95
144.0	1.94	1.89	1583	2.99
146.0	1.92	1.87	1586	2.96
148.0	1.95	1.89	1583	3.00
150.0	1.94	1.89	1593	3.01
152.0	1.92	1.86	1600	2.97
154.0	1.94	1.89	1603	3.02
156.0	1.96	1.91	1600	3.05
158.0	1.96	1.91	1619	3.08
160.0	1.95	1.89	1605	3.04
162.0	1.92	1.87	1598	2.98
164.0	1.94	1.89	1603	3.03
166.0	1.97	1.91	1605	3.07
168.0	1.94	1.88	1604	3.02
170.0	1.94	1.89	1592	3.00
172.0	1.95	1.89		
174.0	1.94	1.89	1592	3.00
176.0	1.93	1.87		
178.0	1.99	1.93		
180.0	2.06	2.00		
182.0	1.92	1.86		
184.0	1.87	1.81		
186.0	1.91	1.86		
188.0	1.94	1.88	1582	2.97
190.0	1.91	1.86	1563	2.90
192.0	1.95	1.89	1555	2.94
194.0	1.96	1.90	1564	2.97
196.0	1.98	1.92	1568	3.01
198.0	1.97	1.92	1568	3.00
200.0	2.02	1.96	1567	3.08
202.0	2.00	1.94	1565	3.04
204.0	2.03	1.97	1576	3.10
206.0	2.01	1.96	1576	3.09
208.0	2.00	1.94	1572	3.05
210.0	1.97	1.92	1569	3.00
212.0	1.97	1.92	1553	2.98

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
214.0	1.93	1.87	1556	2.91
216.0	1.92	1.86	1551	2.89
218.0	1.95	1.89	1545	2.93
220.0	1.95	1.90	1556	2.95
222.0	1.95	1.89	1555	2.94
224.0	1.97	1.91	1550	2.96
226.0	1.93	1.88	1548	2.91
228.0	1.95	1.89	1552	2.93
230.0	1.95	1.89	1538	2.91
232.0	1.94	1.88	1542	2.90
234.0	1.91	1.85	1518	2.81
236.0	1.65	1.59		
238.0	1.99	1.94		

KW-PE-GC-215

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.73	1.67		
2.0	1.79	1.73		
4.0	1.83	1.77		
6.0	1.87	1.81		
8.0	1.87	1.81		
10.0	1.86	1.80		
12.0	1.89	1.83		
14.0	1.93	1.87		
16.0	1.91	1.85		
18.0	1.91	1.86		
20.0	1.92	1.87		
22.0	1.93	1.87		
24.0	1.94	1.88		
26.0	1.94	1.88		
28.0	1.90	1.85		
30.0	1.94	1.88		
32.0	1.95	1.89		
34.0	1.98	1.92		
36.0	1.99	1.94		
38.0	1.95	1.89		
40.0	1.96	1.90		
42.0	1.95	1.90		
44.0	1.97	1.91		
46.0	1.99	1.94		
48.0	1.96	1.91		
50.0	1.95	1.89		
52.0	1.94	1.88		
54.0	1.96	1.91		
56.0	1.97	1.91		
58.0	1.99	1.93		
60.0	1.92	1.87		
62.0	1.96	1.90		
64.0	1.99	1.93		
66.0	1.97	1.91		
68.0	1.96	1.90		
70.0	1.98	1.92		
72.0	1.96	1.90		
74.0	2.00	1.94		
76.0	2.02	1.96		
78.0	2.04	1.98		
80.0	1.97	1.91		
82.0	2.05	1.99		
84.0	1.75	1.70		
86.0	1.93	1.87		
88.0	1.96	1.91	1567	2.99
90.0	1.92	1.86	1553	2.89
92.0	1.95	1.89	1564	2.96
94.0	1.96	1.91	1556	2.97
96.0	1.93	1.88	1556	2.92
98.0	1.94	1.88	1554	2.93
100.0	1.92	1.86	1539	2.87
102.0	1.94	1.89	1553	2.93

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.97	1.92	1557	2.98
106.0	1.92	1.86	1547	2.88
108.0	1.97	1.91	1546	2.95
110.0	1.94	1.88	1546	2.91
112.0	1.94	1.88	1547	2.91
114.0	1.94	1.88	1556	2.93
116.0	1.96	1.90	1560	2.97
118.0	1.95	1.89	1561	2.95
120.0	1.98	1.92	1558	2.99
122.0	1.94	1.89	1558	2.94
124.0	1.95	1.89	1550	2.94
126.0	1.93	1.87	1548	2.89
128.0	1.96	1.90	1550	2.95
130.0	1.93	1.87	1545	2.89
132.0	1.99	1.93	1559	3.01
134.0	1.91	1.85	1545	2.86
136.0	1.86	1.81	1529	2.76
138.0	1.82	1.76	1526	2.68
140.0	1.95	1.89	1543	2.92
142.0	1.99	1.93	1563	3.02
144.0	1.97	1.91	1560	2.98
146.0	1.95	1.89	1562	2.95
148.0	1.95	1.90	1562	2.96
150.0	1.98	1.93	1570	3.02
152.0	1.96	1.90	1571	2.99
154.0	1.96	1.90	1575	2.99
156.0	1.99	1.94	1582	3.06
158.0	1.98	1.93	1598	3.08
160.0	1.97	1.91		
162.0	1.96	1.90	1574	2.99
164.0	1.94	1.89	1562	2.95
166.0	1.91	1.85	1562	2.89
168.0	1.94	1.88	1573	2.96
170.0	1.98	1.92	1577	3.03
172.0	1.94	1.88	1581	2.98
174.0	1.94	1.88	1580	2.97
176.0	1.94	1.88		
178.0	2.01	1.95	1444	2.82
180.0	2.06	2.00	1602	3.20
182.0	1.99	1.93	1543	2.98
184.0	1.95	1.89	1521	2.88
186.0	1.97	1.91		
188.0	1.98	1.93		
190.0	1.74	1.68		
192.0	1.95	1.89		
194.0	2.02	1.96	1555	3.05
196.0	2.03	1.97		
198.0	2.06	2.00		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.80	1.75		
2.0	1.79	1.73		
4.0	1.75	1.69		
6.0	1.80	1.75		
8.0	1.80	1.74		
10.0	1.81	1.75		
12.0	1.80	1.75		
14.0	1.77	1.71		
16.0	1.76	1.71		
18.0	1.72	1.67		
20.0	1.79	1.73		
22.0	1.85	1.79		
24.0	1.84	1.78		
26.0	1.85	1.79		
28.0	1.87	1.81		
30.0	1.88	1.82		
32.0	1.86	1.80		
34.0	1.89	1.83		
36.0	1.88	1.83	1574	2.87
38.0	1.90	1.84	1575	2.90
40.0	1.87	1.81	1564	2.83
42.0	1.86	1.81	1561	2.82
44.0	1.87	1.81	1565	2.83
46.0	1.87	1.81	1565	2.84
48.0	1.89	1.83	1569	2.87
50.0	1.87	1.82	1566	2.84
52.0	1.87	1.82	1562	2.84
54.0	1.87	1.82	1562	2.84
56.0	1.88	1.83	1565	2.86
58.0	1.88	1.82	1562	2.84
60.0	1.87	1.82	1565	2.84
62.0	1.87	1.81	1564	2.84
64.0	1.86	1.80	1559	2.81
66.0	1.86	1.81	1567	2.83
68.0	1.87	1.81	1569	2.85
70.0	1.88	1.83	1566	2.86
72.0	1.90	1.84	1564	2.87
74.0	1.89	1.83	1564	2.87
76.0	1.89	1.83	1565	2.87
78.0	1.91	1.85	1568	2.91
80.0	1.94	1.89	1425	2.69
82.0	1.92	1.86		
84.0	1.91	1.86		
86.0	1.93	1.87		
88.0	1.98	1.93	1569	3.02
90.0	1.80	1.74	1508	2.63
92.0	1.87	1.81	1528	2.76
94.0	1.89	1.83		
96.0	1.88	1.82	1564	2.85
98.0	1.90	1.84	1556	2.87
100.0	1.88	1.82	1557	2.84
102.0	1.92	1.86	1559	2.91

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.93	1.88	1573	2.95
106.0	1.93	1.88	1568	2.94
108.0	1.95	1.89	1573	2.98
110.0	1.97	1.91	1577	3.01
112.0	1.95	1.89	1564	2.96
114.0	1.96	1.90	1557	2.96
116.0	1.99	1.93	1567	3.02
118.0	1.99	1.93	1570	3.03
120.0	1.96	1.91	1570	2.99
122.0	1.98	1.92	1581	3.04
124.0	1.94	1.89		
126.0	1.92	1.86		
128.0	2.10	2.04		
130.0	1.90	1.84		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.52	1.47		
2.0	1.83	1.77		
4.0	1.79	1.73		
6.0	1.67	1.61		
8.0	1.68	1.62	1508	2.45
10.0	1.65	1.60	1544	2.47
12.0	1.61	1.55		
14.0	1.71	1.65	1536	2.54
16.0	1.72	1.66	1533	2.55
18.0	1.73	1.67	1524	2.55
20.0	1.75	1.69	1539	2.60
22.0	1.81	1.75	1549	2.71
24.0	1.88	1.82	1536	2.80
26.0	1.83	1.78	1519	2.70
28.0	1.87	1.81	1528	2.77
30.0	1.89	1.83	1544	2.83
32.0	1.88	1.82	1543	2.81
34.0	1.87	1.82	1544	2.81
36.0	1.93	1.87	1552	2.90
38.0	1.91	1.85	1544	2.86
40.0	1.91	1.85	1543	2.85
42.0	1.92	1.86	1547	2.87
44.0	1.91	1.86	1546	2.87
46.0	1.87	1.81	1543	2.80
48.0	1.89	1.84	1538	2.82
50.0	1.85	1.79	1538	2.76
52.0	1.92	1.86	1538	2.86
54.0	1.90	1.85	1539	2.84
56.0	1.88	1.82	1532	2.79
58.0	1.92	1.86	1536	2.86
60.0	1.89	1.83	1537	2.82
62.0	1.90	1.84	1537	2.83
64.0	1.92	1.86	1540	2.87
66.0	1.91	1.85	1535	2.84
68.0	1.88	1.82	1534	2.80
70.0	1.88	1.82	1532	2.79
72.0	1.91	1.85	1535	2.84
74.0	1.92	1.86	1541	2.87
76.0	1.93	1.87	1536	2.87
78.0	1.92	1.86	1539	2.86
80.0	1.93	1.87	1542	2.88
82.0	1.96	1.90	1547	2.94
84.0	1.98	1.92	1550	2.98
86.0	1.94	1.88		
88.0	1.94	1.88		
90.0	2.04	1.99		
92.0	2.03	1.97		
94.0	1.97	1.91		
96.0	1.91	1.85		
98.0	1.88	1.83		
100.0	1.90	1.84	1542	2.84
102.0	1.99	1.93	1551	3.00

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.98	1.92	1564	3.00
106.0	1.93	1.88	1566	2.94
108.0	1.94	1.88	1562	2.94
110.0	1.94	1.88	1556	2.92
112.0	1.97	1.91	1572	3.00
114.0	1.95	1.90	1571	2.98
116.0	1.98	1.93	1579	3.04
118.0	1.96	1.91	1571	2.99
120.0	1.99	1.93	1584	3.06
122.0	1.96	1.91	1568	2.99
124.0	1.97	1.91	1561	2.98
126.0	1.98	1.92	1571	3.02
128.0	1.98	1.92	1571	3.02
130.0	2.02	1.96	1570	3.08
132.0	1.98	1.92	1572	3.02
134.0	2.02	1.96	1582	3.10
136.0	1.81	1.75		
138.0	1.96	1.90		
140.0	1.95	1.89	1566	2.96
142.0	2.04	1.98		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.62	1.56		
2.0	1.80	1.74		
4.0	1.85	1.79	1486	2.66
6.0	1.87	1.81	1486	2.70
8.0	1.87	1.82	1487	2.70
10.0	1.88	1.82	1489	2.71
12.0	1.88	1.83	1483	2.71
14.0	1.88	1.83	1484	2.71
16.0	1.91	1.85	1486	2.75
18.0	1.91	1.86	1486	2.76
20.0	1.94	1.88	1492	2.80
22.0	1.93	1.88	1492	2.80
24.0	1.95	1.90	1494	2.83
26.0	1.94	1.88	1494	2.82
28.0	1.92	1.86	1490	2.77
30.0	1.92	1.86	1494	2.78
32.0	1.93	1.88	1499	2.81
34.0	1.95	1.90	1497	2.84
36.0	1.96	1.90	1502	2.86
38.0	1.96	1.90	1506	2.86
40.0	1.95	1.90	1498	2.84
42.0	1.93	1.87	1494	2.80
44.0	1.93	1.88	1492	2.80
46.0	1.93	1.87	1494	2.80
48.0	1.93	1.87	1497	2.80
50.0	1.97	1.92	1507	2.89
52.0	1.96	1.90	1501	2.85
54.0	1.97	1.91	1508	2.89
56.0	1.96	1.91	1504	2.87
58.0	1.99	1.93	1498	2.90
60.0	1.95	1.90	1496	2.83
62.0	1.94	1.88	1500	2.83
64.0	1.96	1.90	1505	2.86
66.0	1.95	1.90	1503	2.85
68.0	1.95	1.90	1498	2.84
70.0	1.98	1.92	1505	2.89
72.0	1.99	1.93	1487	2.88
74.0	1.99	1.94	1493	2.89
76.0	1.97	1.91	1501	2.87
78.0	1.99	1.93	1499	2.89
80.0	1.97	1.92	1507	2.89
82.0	1.99	1.94	1506	2.92
84.0	2.03	1.98	1496	2.96
86.0	2.11	2.05	1524	3.13
88.0	2.01	1.95	1572	3.06
90.0	1.96	1.91		
92.0	1.96	1.90		
94.0	2.05	1.99	1490	2.97
96.0	2.16	2.10		
98.0	1.98	1.92		
100.0	1.93	1.88		
102.0	1.96	1.91	1542	2.94

Depth (cm)	Boyce corrected gamma density (g/cm³)	Pycnometer cal. Boyce corr. den. (g/cm³)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.96	1.91	1535	2.93
106.0	1.92	1.86	1532	2.85
108.0	1.94	1.88	1535	2.89
110.0	1.96	1.90	1539	2.93
112.0	1.97	1.91	1530	2.93
114.0	2.00	1.94	1530	2.97
116.0	1.98	1.92	1541	2.96
118.0	1.98	1.93	1538	2.96
120.0	2.01	1.95	1538	3.00
122.0	1.98	1.92	1536	2.95
124.0	2.00	1.94	1551	3.01
126.0	2.03	1.97	1551	3.05
128.0	2.04	1.98	1556	3.08
130.0	2.01	1.95	1554	3.03
132.0	1.99	1.94	1551	3.00
134.0	1.99	1.94	1551	3.00
136.0	1.98	1.93	1541	2.97
138.0	1.99	1.93	1540	2.98
140.0	2.00	1.94	1555	3.01
142.0	2.00	1.94	1565	3.04
144.0	2.04	1.98	1568	3.10
146.0	2.00	1.94	1558	3.02
148.0	1.98	1.92	1548	2.97
150.0	2.00	1.94	1542	2.99
152.0	1.98	1.92	1552	2.98
154.0	2.00	1.94	1552	3.02
156.0	1.99	1.94	1536	2.97
158.0	1.99	1.93	1547	2.99
160.0	1.95	1.89		
162.0	1.69	1.63		
164.0	2.00	1.94		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.85	1.79	1576	2.83
2.0	1.79	1.73	1566	2.71
4.0	1.80	1.74	1567	2.73
6.0	1.83	1.77	1579	2.79
8.0	1.81	1.75	1567	2.74
10.0	1.81	1.75	1552	2.72
12.0	1.77	1.72	1567	2.69
14.0	1.82	1.76	1576	2.78
16.0	1.83	1.78	1574	2.80
18.0	1.85	1.79	1574	2.82
20.0	1.86	1.80	1573	2.83
22.0	1.86	1.80	1576	2.84
24.0	1.85	1.79	1579	2.83
26.0	1.87	1.81	1576	2.85
28.0	1.85	1.79	1582	2.83
30.0	1.86	1.80	1577	2.84
32.0	1.84	1.78	1575	2.81
34.0	1.87	1.81	1581	2.86
36.0	1.88	1.83	1585	2.89
38.0	1.89	1.83	1587	2.91
40.0	1.90	1.84	1582	2.92
42.0	1.86	1.80	1585	2.86
44.0	1.85	1.80	1581	2.84
46.0	1.86	1.80	1575	2.84
48.0	1.85	1.79	1575	2.82
50.0	1.85	1.80	1573	2.82
52.0	1.83	1.77	1578	2.80
54.0	1.84	1.79	1573	2.81
56.0	1.87	1.81	1583	2.86
58.0	1.84	1.79	1575	2.81
60.0	1.86	1.80	1575	2.84
62.0	1.85	1.79	1581	2.84
64.0	1.80	1.74	1568	2.73
66.0	1.86	1.80	1576	2.84
68.0	1.84	1.79	1587	2.84
70.0	1.89	1.83	1567	2.87
72.0	1.90	1.84	1571	2.89
74.0	1.84	1.78	1570	2.80
76.0	1.84	1.79	1569	2.80
78.0	1.86	1.80	1569	2.83
80.0	1.86	1.80	1570	2.83
82.0	1.86	1.81	1568	2.83
84.0	1.86	1.80	1563	2.81
86.0	1.86	1.80	1569	2.82
88.0	1.84	1.78		
90.0	1.88	1.82		
92.0	1.88	1.82		
94.0	1.92	1.87		
96.0	1.89	1.83		
98.0	1.91	1.85		
100.0	1.91	1.86	1574	2.92
102.0	1.91	1.85	1572	2.92

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.90	1.84	1565	2.88
106.0	1.94	1.88	1571	2.96
108.0	1.93	1.87	1569	2.94
110.0	1.93	1.88	1577	2.96
112.0	1.93	1.88	1572	2.95
114.0	1.94	1.88	1578	2.97
116.0	1.96	1.91	1572	3.00
118.0	1.97	1.91	1588	3.03
120.0	1.96	1.90	1585	3.02
122.0	1.97	1.91	1474	2.82
124.0	1.97	1.91	1592	3.04
126.0	1.99	1.93	1589	3.07
128.0	1.98	1.92	1587	3.05
130.0	1.90	1.84	1568	2.89
132.0	1.94	1.89	1562	2.95
134.0	2.01	1.95	1599	3.12
136.0	1.93	1.87		
138.0	1.63	1.57		
140.0	2.06	2.01		
142.0	2.01	1.95		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.72	1.66	1529	2.54
2.0	1.75	1.70	1535	2.60
4.0	1.78	1.72	1538	2.64
6.0	1.80	1.75	1538	2.69
8.0	1.81	1.75	1535	2.69
10.0	1.82	1.76	1531	2.69
12.0	1.80	1.75	1528	2.67
14.0	1.80	1.74	1524	2.65
16.0	1.81	1.76	1525	2.68
18.0	1.82	1.77	1525	2.69
20.0	1.80	1.74	1524	2.66
22.0	1.82	1.76	1522	2.68
24.0	1.81	1.76	1527	2.68
26.0	1.82	1.76	1522	2.68
28.0	1.82	1.76	1523	2.68
30.0	1.82	1.76	1526	2.69
32.0	1.81	1.76	1527	2.68
34.0	1.86	1.81	1539	2.78
36.0	1.86	1.80	1539	2.78
38.0	1.85	1.80	1534	2.76
40.0	1.85	1.80	1537	2.76
42.0	1.90	1.84	1538	2.83
44.0	1.88	1.83	1539	2.81
46.0	1.88	1.82	1539	2.80
48.0	1.87	1.81	1541	2.80
50.0	1.87	1.81	1532	2.78
52.0	1.86	1.80	1532	2.76
54.0	1.88	1.83	1535	2.80
56.0	1.88	1.82	1536	2.80
58.0	1.87	1.82	1532	2.78
60.0	1.87	1.81	1532	2.77
62.0	1.86	1.81	1535	2.77
64.0	1.85	1.79	1529	2.74
66.0	1.88	1.82	1530	2.78
68.0	1.86	1.80	1528	2.76
70.0	1.86	1.80	1533	2.77
72.0	1.85	1.79	1530	2.74
74.0	1.87	1.81	1533	2.78
76.0	1.88	1.82	1534	2.79
78.0	1.88	1.82	1536	2.80
80.0	1.89	1.83	1549	2.84
82.0	1.88	1.82		
84.0	1.97	1.91	1524	2.91
86.0	1.90	1.85		
88.0	1.88	1.82		
90.0	1.73	1.67		
92.0	1.70	1.64	1540	2.52
94.0	1.88	1.83	1573	2.87
96.0	1.86	1.80	1578	2.84
98.0	1.86	1.81	1572	2.84
100.0	1.87	1.81	1581	2.86
102.0	1.90	1.84	1582	2.92

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.88	1.82	1567	2.86
106.0	1.87	1.81	1580	2.86
108.0	1.89	1.83	1583	2.91
110.0	1.86	1.81	1582	2.86
112.0	1.89	1.83	1581	2.89
114.0	1.89	1.84	1583	2.91
116.0	1.86	1.80	1578	2.84
118.0	1.89	1.83	1582	2.90
120.0	1.95	1.89		
122.0	1.94	1.89	1585	2.99
124.0	1.89	1.83	1595	2.92
126.0	1.94	1.89		
128.0	1.91	1.86	1597	2.97
130.0	1.88	1.83	1600	2.93
132.0	1.94	1.88	1611	3.03
134.0	1.90	1.84	1596	2.94
136.0	1.92	1.86	1602	2.99
138.0	1.95	1.90	1617	3.07
140.0	1.92	1.87	1607	3.00
142.0	1.94	1.89	1603	3.03
144.0	1.89	1.83	1595	2.92
146.0	1.90	1.84	1591	2.93
148.0	1.87	1.81	1581	2.87
150.0	1.88	1.83	1589	2.90
152.0	1.92	1.86	1594	2.97
154.0	1.90	1.84	1603	2.95
156.0	1.93	1.87	1605	3.00
158.0	1.90	1.84	1591	2.93
160.0	1.90	1.84	1583	2.91
162.0	1.93	1.87	1586	2.97
164.0	1.90	1.84	1585	2.92
166.0	1.92	1.86	1586	2.95
168.0	1.93	1.88	1597	3.00
170.0	1.93	1.87	1590	2.97
172.0	1.90	1.84	1587	2.93
174.0	1.90	1.84	1585	2.92
176.0	1.91	1.86	1603	2.98
178.0	1.94	1.89	1602	3.02
180.0	1.96	1.90	1608	3.06
182.0	1.91	1.86	1568	2.91
184.0	1.89	1.84	1575	2.89
186.0	1.90	1.84	1565	2.88
188.0	1.92	1.86	1573	2.93
190.0	1.89	1.83	1572	2.88
192.0	1.90	1.84	1579	2.91
194.0	1.36	1.30	1577	2.05
196.0	1.35	1.29		
198.0	1.88	1.82	1525	2.78
200.0	1.91	1.85		

3.2.2.2 Marquesas Keys Core Logger Data:

KW-PE-GC-181
KW-PE-GC-182
KW-PE-GC-194
KW-PE-GC-236
KW-PE-GC-237
KW-PE-GC-239
KW-PE-GC-240
KW-PE-GC-285
KW-PE-GC-288
KW-PE-GC-289

KW-PE-GC-181

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.96	1.90		
2.0	1.93	1.87		
4.0	1.96	1.90		
6.0	1.93	1.88		
8.0	1.87	1.81		
10.0	1.93	1.88		
12.0	1.98	1.92		
14.0	1.95	1.89		
16.0	1.90	1.84		
18.0	1.98	1.92		
20.0	1.94	1.88		
22.0	1.98	1.92		
24.0	2.01	1.96	1573	3.08
26.0	1.98	1.93	1621	3.12
28.0	2.02	1.97	1619	3.18

KW-PE-GC-182

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.62	1.56	1523	2.38
2.0	1.79	1.73	1543	2.67
4.0	1.82	1.77	1557	2.75
6.0	1.84	1.78	1564	2.78
8.0	1.88	1.82	1562	2.84
10.0	1.88	1.82	1564	2.84
12.0	1.90	1.84	1574	2.90
14.0	1.89	1.83	1566	2.87
16.0	1.91	1.85	1576	2.92
18.0	1.91	1.85	1570	2.90
20.0	1.90	1.84	1578	2.91
22.0	1.91	1.85	1574	2.91
24.0	1.90	1.84	1573	2.90
26.0	1.87	1.81	1566	2.84
28.0	1.89	1.84	1561	2.87
30.0	1.88	1.82	1566	2.85
32.0	1.93	1.87	1561	2.92
34.0	1.95	1.89	1569	2.97
36.0	1.95	1.89	1578	2.98
38.0	1.94	1.88	1579	2.97
40.0	1.95	1.89	1569	2.96
42.0	1.93	1.88	1565	2.94
44.0	1.97	1.91	1569	3.00
46.0	2.00	1.94		
48.0	1.99	1.93	1630	3.15
50.0	1.96	1.91	1580	3.01
52.0	1.98	1.92	1576	3.03
54.0	1.95	1.89	1566	2.96
56.0	1.99	1.93	1568	3.03
58.0	1.96	1.91	1566	2.99
60.0	1.98	1.92	1565	3.00
62.0	1.95	1.90	1557	2.95
64.0	1.96	1.91	1570	2.99
66.0	2.00	1.94	1566	3.05
68.0	1.99	1.93	1586	3.06
70.0	2.03	1.97		
72.0	1.98	1.92	1598	3.07
74.0	1.97	1.92	1588	3.04
76.0	1.94	1.89	1574	2.97
78.0	1.97	1.91	1582	3.02
80.0	1.96	1.90	1577	3.00
82.0	1.91	1.85	1582	2.93
84.0	1.95	1.89		
86.0	1.98	1.92		
88.0	2.01	1.95		
90.0	1.97	1.91		
92.0	1.92	1.86		
94.0	1.98	1.92		
96.0	1.96	1.90	1544	2.93
98.0	1.97	1.91	1541	2.95
100.0	1.93	1.88	1556	2.92
102.0	1.93	1.87	1566	2.93

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.97	1.91	1558	2.98
106.0	1.97	1.92	1563	2.99
108.0	1.96	1.90	1544	2.94
110.0	1.96	1.90	1557	2.96
112.0	1.89	1.83	1540	2.82
114.0	1.89	1.84	1542	2.83
116.0	1.91	1.85	1542	2.86
118.0	1.92	1.86	1526	2.85
120.0	1.91	1.85	1518	2.81
122.0	1.94	1.88	1532	2.88
124.0	2.00	1.94	1562	3.03
126.0	1.94	1.88	1570	2.95
128.0	1.92	1.87	1557	2.90
130.0	1.92	1.87	1569	2.93
132.0	2.00	1.94	1555	3.02
134.0	1.99	1.93	1576	3.04
136.0	1.96	1.90	1577	3.00
138.0	2.02	1.96	1567	3.07
140.0	2.00	1.95	1581	3.08
142.0	1.97	1.91		
144.0	1.95	1.89	1549	2.93
146.0	1.98	1.92		
148.0	1.96	1.91	1550	2.96
150.0	1.95	1.90	1535	2.91

KW-PE-GC-194

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.62	1.57	1511	2.37
2.0	1.68	1.62	1503	2.44
4.0	1.82	1.76	1505	2.65
6.0	1.85	1.80	1515	2.72
8.0	1.87	1.82	1510	2.74
10.0	1.90	1.85	1506	2.78
12.0	1.88	1.82	1530	2.79
14.0	1.88	1.82	1540	2.81
16.0	1.91	1.86	1530	2.84
18.0	1.94	1.88	1545	2.90
20.0	1.91	1.85	1538	2.85
22.0	1.99	1.93	1517	2.93
24.0	1.98	1.93		
26.0	1.98	1.92	1525	2.93
28.0	1.91	1.85		
30.0	1.92	1.87	1528	2.85
32.0	1.99	1.93	1529	2.95
34.0	1.90	1.84	1493	2.75
36.0	1.93	1.88	1498	2.81
38.0	1.94	1.89	1507	2.84
40.0	1.90	1.84	1504	2.76
42.0	1.89	1.84	1507	2.77
44.0	1.88	1.82	1505	2.74
46.0	1.87	1.82	1511	2.75
48.0	1.89	1.83	1515	2.78
50.0	1.88	1.82	1509	2.75
52.0	1.88	1.82	1509	2.75
54.0	1.86	1.80	1504	2.71
56.0	1.85	1.79	1500	2.68
58.0	1.85	1.79	1497	2.68
60.0	1.84	1.78	1492	2.66
62.0	1.83	1.78	1492	2.65
64.0	1.86	1.80	1491	2.69
66.0	1.84	1.78	1490	2.66
68.0	1.82	1.76	1491	2.62
70.0	1.83	1.77	1485	2.63
72.0	1.80	1.75	1488	2.60
74.0	1.85	1.80	1488	2.67
76.0	1.83	1.77	1497	2.65
78.0	1.75	1.69	1497	2.54
80.0	1.78	1.72	1492	2.57
82.0	1.89	1.84		
84.0	1.92	1.86		
86.0	1.84	1.78		
88.0	1.75	1.69		
90.0	1.74	1.69		
92.0	1.84	1.79		
94.0	1.76	1.70		
96.0	1.81	1.75		
98.0	1.82	1.76		
100.0	1.81	1.75		
102.0	1.84	1.79		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.83	1.77		
106.0	1.87	1.81		
108.0	1.89	1.83		
110.0	1.90	1.84		
112.0	1.89	1.83		
114.0	1.88	1.83		
116.0	1.86	1.81		
118.0	1.87	1.82		
120.0	1.94	1.89		
122.0	1.90	1.84	1509	2.78
124.0	1.90	1.84		
126.0	1.92	1.86	1492	2.78
128.0	1.86	1.80		
130.0	1.87	1.81		
132.0	1.90	1.85		
134.0	1.90	1.84		
136.0	1.85	1.80		
138.0	1.90	1.84		
140.0	1.87	1.81		
142.0	1.89	1.84		
144.0	1.97	1.92		
146.0	1.95	1.90		
148.0	1.92	1.87		
150.0	1.95	1.89	1551	2.93
152.0	1.93	1.87		
154.0	1.95	1.90		
156.0	1.95	1.90		
158.0	1.88	1.82	1506	2.74

KW-PE-GC-236

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.79	1.74		
2.0	1.77	1.71		
4.0	1.76	1.70		
6.0	1.80	1.74		
8.0	1.77	1.71		
10.0	1.88	1.82		
12.0	1.93	1.87		
14.0	1.89	1.83		
16.0	1.90	1.85		
18.0	1.91	1.85		
20.0	1.90	1.84		
22.0	1.85	1.79		
24.0	1.90	1.84		
26.0	1.90	1.84		
28.0	1.87	1.81	1508	2.73
30.0	1.94	1.89	1528	2.88
32.0	1.95	1.89		
34.0	1.96	1.90	1484	2.82
36.0	1.92	1.86	1515	2.82
38.0	1.87	1.82	1508	2.74
40.0	1.92	1.86	1524	2.84
42.0	1.86	1.80	1494	2.70
44.0	1.95	1.90	1505	2.86
46.0	1.85	1.80	1508	2.71
48.0	1.91	1.86	1502	2.79
50.0	1.91	1.86	1509	2.80
52.0	1.84	1.78	1500	2.67
54.0	1.91	1.85	1472	2.72
56.0	1.86	1.81	1488	2.69
58.0	1.87	1.82	1497	2.72
60.0	1.88	1.82	1509	2.75
62.0	1.92	1.86	1524	2.83
64.0	1.85	1.80		
66.0	1.86	1.80		
68.0	1.80	1.74		
70.0	1.92	1.86	1520	2.83
72.0	1.88	1.83	1502	2.75
74.0	1.84	1.78	1494	2.66
76.0	1.89	1.84	1514	2.78
78.0	1.88	1.83	1509	2.76
80.0	1.89	1.83	1509	2.76
82.0	1.86	1.80		
84.0	1.94	1.88		
86.0	1.83	1.77		
88.0	1.93	1.87		
90.0	1.83	1.77		
92.0	1.98	1.92		
94.0	1.94	1.89		
96.0	1.87	1.82		
98.0	1.89	1.83		
100.0	1.92	1.87		
102.0	1.85	1.79		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.87	1.82		
106.0	1.91	1.85		
108.0	1.95	1.90		
110.0	1.94	1.88		
112.0	1.89	1.84		
114.0	1.89	1.83		
116.0	1.90	1.85		
118.0	1.82	1.76		
120.0	1.97	1.91		
122.0	1.99	1.93		
124.0	1.91	1.85		
126.0	1.86	1.81		
128.0	1.81	1.75		
130.0	1.87	1.81		
132.0	1.80	1.74		
134.0	1.85	1.80		
136.0	1.89	1.83		
138.0	1.88	1.83		
140.0	1.88	1.82		
142.0	1.87	1.81		
144.0	1.87	1.81		
146.0	1.91	1.85		
148.0	1.88	1.83		
150.0	1.90	1.85		
152.0	1.91	1.86		
154.0	1.97	1.91		
156.0	1.88	1.83		
158.0	2.00	1.95	1503	2.93
160.0	1.99	1.93	1487	2.87
162.0	1.95	1.89	1475	2.79
164.0	2.00	1.95	1492	2.90
166.0	2.00	1.95	1494	2.91
168.0	2.00	1.94	1488	2.89
170.0	1.95	1.89		
172.0	2.02	1.96		
174.0	2.00	1.95		
176.0	1.99	1.93		

KW-PE-GC-237

Depth (cm)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm^{2}s x 10^5)
0.0	1.89		
2.0	1.88		
4.0	1.89	1509	2.85
6.0	1.82	1496	2.72
8.0	1.81	1480	2.68
10.0	1.83	1480	2.71
12.0	1.83	1481	2.71
14.0	1.79	1482	2.65
16.0	1.95	1519	2.96
18.0	1.89	1490	2.82
20.0	1.87	1486	2.78
22.0	1.89	1486	2.80
24.0	1.83		
26.0	1.82		
28.0	1.81		
30.0	1.90	1491	2.83
32.0	1.97	1497	2.95
34.0	1.91	1472	2.81
36.0	1.91	1484	2.83
38.0	1.95	1487	2.90
40.0	1.90	1486	2.82
42.0	1.91	1477	2.82
44.0	1.88		
46.0	1.83		
48.0	1.83		
50.0	1.87		
52.0	1.85		
54.0	1.87		
56.0	1.80		
58.0	1.79		
60.0	1.81		
62.0	1.85		
64.0	1.84		
66.0	1.84		
68.0	1.82		
70.0	1.77		
72.0	1.76		
74.0	1.77		
76.0	1.83		
78.0	1.81		
80.0	1.79		
82.0	1.75		
84.0	1.78		
86.0	1.71		
88.0	1.77		
90.0	1.83		
92.0	1.81		
94.0	1.71		
96.0	1.74		
98.0	1.76		
100.0	1.79		
102.0	1.77		

Depth (cm)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
104.0	1.77		
106.0	1.75		
108.0	1.79		
110.0	1.72		
112.0	1.71		
114.0	1.72		
116.0	1.71		
118.0	1.73		
120.0	1.72		
122.0	1.67		
124.0	1.73		
126.0	1.71		
128.0	1.74		
130.0	1.74		
132.0	1.75		
134.0	1.81		
136.0	1.76		
138.0	1.80		
140.0	1.81		
142.0	1.87		
144.0	1.82		
146.0	1.82		
148.0	1.87		
150.0	1.90		
152.0	1.89		
154.0	1.85		
156.0	1.89		
158.0	1.97		
160.0	1.98		
162.0	1.99		
164.0	1.89		
166.0	1.97		
168.0	1.97	1541	3.04
170.0	1.94	1503	2.92
172.0	1.97	1545	3.04
174.0	1.95	1498	2.92
176.0	1.95	1492	2.90
178.0	2.02	1499	3.03
180.0	1.95	1479	2.88
182.0	1.95	1508	2.94
184.0	2.03	1533	3.11
186.0	2.01		
188.0	2.09	1552	3.25
190.0	2.11		
192.0	1.75		
194.0	1.96		
196.0	2.00	1590	3.19
198.0	2.00	1579	3.16
200.0	2.00		
202.0	1.94	1614	3.14
204.0	1.92	1541	2.96
206.0	1.96	1573	3.08
208.0	1.92	1570	3.01
210.0	1.93	1578	3.04

Depth (cm)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
212.0	1.96	1580	3.10
214.0	1.93	1591	3.06
216.0	1.91	1587	3.04
218.0	1.94	1583	3.07
220.0	1.99		

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Depth (cm)	Boyce corrected gamma density (g/cm³)	Pycnometer cal. Boyce corr. den. (g/cm³)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.81	1.75		
2.0	1.86	1.80		
4.0	1.85	1.80		
6.0	1.94	1.88		
8.0	1.87	1.81		
10.0	1.89	1.84		
12.0	1.94	1.88		
14.0	1.88	1.83	1540	2.81
16.0	1.85	1.79	1542	2.76
18.0	1.85	1.79	1543	2.77
20.0	1.91	1.86	1568	2.91
22.0	1.91	1.86	1563	2.90
24.0	1.90	1.84	1541	2.83
26.0	1.86	1.80	1544	2.78
28.0	1.95	1.89	1547	2.92
30.0	1.93	1.87	1547	2.89
32.0	1.89	1.84	1542	2.83
34.0	1.88	1.82	1535	2.80
36.0	1.91	1.85	1529	2.83
38.0	1.85	1.79	1522	2.73
40.0	1.86	1.80	1522	2.74
42.0	1.90	1.84	1533	2.83
44.0	1.92	1.86	1534	2.85
46.0	1.92	1.86	1540	2.87
48.0	1.83	1.78	1517	2.69
50.0	1.85	1.79	1533	2.75
52.0	1.85	1.80	1516	2.72
54.0	1.89	1.83	1530	2.80
56.0	1.93	1.88	1539	2.89
58.0	1.91	1.85	1518	2.81
60.0	1.88	1.82	1524	2.77
62.0	1.92	1.86	1547	2.88
64.0	1.92	1.86	1549	2.88
66.0	1.85	1.79	1535	2.75
68.0	1.90	1.84	1524	2.80
70.0	1.87	1.82	1506	2.74
72.0	1.88	1.82	1502	2.73
74.0	1.89	1.83	1520	2.78
76.0	1.84	1.79	1510	2.70
78.0	1.89	1.84	1516	2.79
80.0	1.86	1.80	1540	2.77
82.0	1.84	1.78	1531	2.73
84.0	1.86	1.80	1515	2.73
86.0	1.80	1.74	1502	2.62
88.0	1.76	1.70		
90.0	1.88	1.82	1505	2.74
92.0	1.94	1.88		
94.0	1.82	1.76		
96.0	1.95	1.90		
98.0	1.93	1.87		
100.0	1.89	1.84		
102.0	1.82	1.77		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.83	1.78		
106.0	1.87	1.81		
108.0	1.95	1.89		
110.0	1.94	1.88		
112.0	1.92	1.87		
114.0	1.94	1.88		
116.0	1.99	1.93		
118.0	1.94	1.88		
120.0	1.94	1.89		
122.0	1.95	1.89		
124.0	1.94	1.88		
126.0	1.95	1.89		
128.0	1.95	1.90		
130.0	1.94	1.88		
132.0	1.93	1.87		
134.0	1.84	1.78		
136.0	1.96	1.90		
138.0	2.00	1.94		
140.0	1.93	1.87		
142.0	1.89	1.83		
144.0	1.82	1.76		
146.0	2.00	1.94		
148.0	2.02	1.97		
150.0	2.01	1.96		
152.0	2.04	1.98	1498	2.96
154.0	2.07	2.02		
156.0	2.08	2.02		
158.0	2.04	1.99		
160.0	1.99	1.93		
162.0	1.93	1.87		
164.0	1.93	1.87		
166.0	2.01	1.95		
168.0	2.06	2.01		
170.0	2.06	2.00	1504	3.01
172.0	2.04	1.98	1494	2.96
174.0	2.02	1.96		
176.0	2.10	2.04		
178.0	2.14	2.08	1528	3.19
180.0	2.10	2.05	1535	3.14
182.0	2.14	2.08		
184.0	2.10	2.04		
186.0	2.03	1.97		
188.0	2.20	2.15		
190.0	2.18	2.13		
192.0	2.02	1.96		
194.0	2.03	1.98		
196.0	2.00	1.94		
198.0	2.04	1.98	1634	3.24
200.0	2.07	2.02	1623	3.27
202.0	1.98	1.92	1616	3.11
204.0	2.02	1.97	1619	3.18
206.0	2.00	1.94	1617	3.14
208.0	1.98	1.92	1619	3.11
210.0	2.01	1.95	1613	3.15

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
212.0	2.00	1.94	1618	3.14
214.0	2.02	1.96	1617	3.17
216.0	1.94	1.88	1629	3.06
218.0	1.79	1.73		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.89	1.83		
2.0	1.89	1.83		
4.0	1.81	1.75		
6.0	1.80	1.74		
8.0	1.80	1.74		
10.0	1.91	1.85		
12.0	1.81	1.75		
14.0	1.84	1.78		
16.0	1.85	1.79		
18.0	1.90	1.84		
20.0	1.96	1.90		
22.0	1.95	1.89		
24.0	1.94	1.88	1545	2.91
26.0	1.97	1.92	1560	2.99
28.0	1.96	1.91	1554	2.96
30.0	1.89	1.84	1529	2.81
32.0	1.92	1.86	1546	2.88
34.0	1.84	1.78	1543	2.75
36.0	1.92	1.86	1542	2.87
38.0	1.92	1.86	1525	2.84
40.0	1.94	1.88	1539	2.89
42.0	1.92	1.86	1547	2.88
44.0	1.88	1.82	1533	2.79
46.0	1.91	1.85	1509	2.80
48.0	1.89	1.83	1515	2.77
50.0	1.88	1.82	1510	2.76
52.0	1.87	1.81	1511	2.74
54.0	1.87	1.82	1499	2.72
56.0	1.89	1.83	1523	2.79
58.0	1.91	1.85	1515	2.80
60.0	1.91	1.86	1523	2.83
62.0	1.90	1.84		
64.0	1.96	1.90		
66.0	1.90	1.84	1544	2.84
68.0	2.02	1.96	1538	3.01
70.0	1.91	1.85	1534	2.84
72.0	1.88	1.82	1512	2.76
74.0	1.89	1.83	1502	2.75
76.0	1.81	1.76	1499	2.63
78.0	1.80	1.74	1493	2.60
80.0	1.82	1.76	1503	2.64
82.0	1.80	1.74	1492	2.60
84.0	1.83	1.77	1511	2.68
86.0	1.86	1.81	1515	2.74
88.0	1.86	1.81		
90.0	1.88	1.83		
92.0	1.75	1.69		
94.0	1.09	1.03		
96.0	1.42	1.36		
98.0	1.76	1.70		
100.0	1.84	1.78		
102.0	1.88	1.82		

Depth (cm)	Boyce corrected gamma density (g/cm³)	Pycnometer cal. Boyce corr. den. (g/cm³)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.86	1.81		
106.0	1.91	1.85	1502	2.78
108.0	1.95	1.90	1501	2.85
110.0	1.90	1.84	1490	2.74
112.0	1.91	1.86	1490	2.76
114.0	1.89	1.84	1491	2.74
116.0	1.92	1.87	1507	2.81
118.0	1.94	1.89	1511	2.85
120.0	1.93	1.87	1523	2.85
122.0	1.96	1.90	1508	2.87
124.0	2.00	1.94	1519	2.95
126.0	1.94	1.89	1511	2.85
128.0	1.96	1.90	1506	2.87
130.0	1.95	1.90	1497	2.84
132.0	1.92	1.86	1505	2.80
134.0	1.98	1.92	1499	2.88
136.0	1.95	1.90	1513	2.87
138.0	1.98	1.92	1523	2.93
140.0	1.93	1.88	1516	2.84
142.0	1.98	1.92	1546	2.97
144.0	1.95	1.89	1532	2.90
146.0	1.96	1.90	1558	2.96
148.0	2.03	1.97		
150.0	1.62	1.56		
152.0	1.94	1.89		
154.0	1.79	1.73		
156.0	1.79	1.74		

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Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
0.0	1.91	1.85		
2.0	1.90	1.85		
4.0	2.02	1.97		
6.0	2.06	2.00		
8.0	1.97	1.92		
10.0	1.94	1.88		
12.0	2.01	1.95		
14.0	1.99	1.94		
16.0	1.96	1.90		
18.0	1.98	1.93		
20.0	1.97	1.92		
22.0	1.93	1.87		
24.0	2.00	1.94	1475	2.87
26.0	2.03	1.98		
28.0	2.02	1.96		
30.0	2.03	1.98		
32.0	1.99	1.93		
34.0	2.07	2.01		
36.0	2.02	1.96		
38.0	1.97	1.92		
40.0	1.95	1.89		
42.0	1.93	1.88		
44.0	1.90	1.85		
46.0	1.90	1.84		
48.0	1.93	1.87		
50.0	1.93	1.88		
52.0	1.97	1.91		
54.0	1.93	1.87		
56.0	1.89	1.83		
58.0	1.95	1.90		
60.0	1.97	1.91		
62.0	1.94	1.88		
64.0	1.89	1.83		
66.0	1.89	1.83		
68.0	1.87	1.81		
70.0	1.88	1.82		
72.0	1.87	1.82		
74.0	1.85	1.80		
76.0	1.87	1.81		
78.0	1.87	1.81		
80.0	1.87	1.82		
82.0	1.96	1.90		
84.0	1.83	1.77		
86.0	1.92	1.86		
88.0	1.93	1.87		
90.0	1.69	1.63		
92.0	1.73	1.68		
94.0	1.74	1.68		
96.0	1.87	1.81		
98.0	1.83	1.77		
100.0	1.87	1.81		
102.0	1.83	1.78	1516	2.69

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
104.0	1.83	1.77	1500	2.65
106.0	1.88	1.82	1526	2.78
108.0	1.88	1.83	1541	2.82
110.0	1.86	1.80	1526	2.74
112.0	1.78	1.73	1517	2.62
114.0	1.85	1.79	1522	2.72
116.0	1.88	1.82	1507	2.75
118.0	1.87	1.81	1507	2.73
120.0	1.84	1.78	1518	2.71
122.0	1.88	1.82	1509	2.75
124.0	1.91	1.85	1526	2.82
126.0	1.90	1.84	1534	2.83
128.0	1.85	1.79	1516	2.71
130.0	1.90	1.84	1509	2.77
132.0	1.92	1.86	1531	2.85
134.0	1.90	1.84	1527	2.81
136.0	1.86	1.80	1525	2.75
138.0	1.90	1.84	1519	2.80
140.0	1.88	1.82	1527	2.79
142.0	1.93	1.87	1535	2.87
144.0	1.90	1.85	1518	2.80
146.0	1.88	1.83	1518	2.77
148.0	1.85	1.79	1519	2.73
150.0	1.83	1.77	1514	2.68
152.0	1.88	1.82	1517	2.76
154.0	1.85	1.79	1514	2.71
156.0	1.86	1.80	1513	2.73
158.0	1.89	1.83	1519	2.79
160.0	1.84	1.78	1525	2.72
162.0	1.87	1.81	1518	2.75
164.0	1.88	1.82	1509	2.74
166.0	1.88	1.82	1499	2.73
168.0	1.89	1.83	1493	2.74
170.0	1.77	1.72	1488	2.55
172.0	1.73	1.67	1507	2.52
174.0	1.81	1.75		
176.0	1.91	1.86	1512	2.81
178.0	1.92	1.86		
180.0	1.90	1.84	1529	2.82
182.0	1.85	1.80	1508	2.71
184.0	1.85	1.79		
186.0	1.88	1.82		
188.0	1.95	1.90	1517	2.88
190.0	1.91	1.85		
192.0	1.89	1.83		
194.0	1.82	1.76		
196.0	1.86	1.80		
198.0	1.88	1.82	1515	2.76
200.0	1.89	1.83	1505	2.75
202.0	1.87	1.81		
204.0	1.89	1.83		
206.0	1.94	1.88	1509	2.84
208.0	1.91	1.85	1507	2.79
210.0	1.85	1.80	1484	2.66

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance ($g/cm^2s \times 10^5$)
212.0	1.86	1.80	1483	2.68
214.0	1.88	1.82	1488	2.71
216.0	1.88	1.83	1493	2.73
218.0	1.92	1.87		
220.0	1.91	1.85	1510	2.80
222.0	1.90	1.84	1486	2.74
224.0	1.89	1.84	1485	2.73
226.0	1.93	1.87	1488	2.78
228.0	1.89	1.83	1485	2.72
230.0	1.88	1.82	1488	2.70
232.0	1.86	1.80	1480	2.67
234.0	1.88	1.82	1483	2.70
236.0	2.15	2.09	1491	3.11
238.0	2.01	1.95	1566	3.05
240.0	1.85	1.80	1489	2.68
242.0	1.88	1.82	1489	2.71
244.0	1.90	1.84	1494	2.75
246.0	1.93	1.87	1494	2.80
248.0	1.93	1.87	1521	2.84
250.0	1.62	1.56		

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Depth (cm)	Boyce corrected gamma density (g/cm³)	Pycnometer cal. Boyce corr. den. (g/cm³)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.77	1.71		
2.0	1.90	1.84		
4.0	1.87	1.81		
6.0	1.93	1.87	1477	2.76
8.0	1.88	1.82	1493	2.72
10.0	1.86	1.81	1487	2.69
12.0	1.90	1.85	1493	2.76
14.0	1.92	1.86	1503	2.79
16.0	1.89	1.83	1504	2.75
18.0	1.92	1.86	1506	2.80
20.0	1.91	1.86	1507	2.80
22.0	1.95	1.89	1505	2.85
24.0	1.89	1.84	1496	2.75
26.0	1.91	1.85	1501	2.78
28.0	1.86	1.81	1493	2.70
30.0	1.90	1.84	1503	2.76
32.0	1.96	1.91	1501	2.86
34.0	1.96	1.90	1509	2.87
36.0	1.98	1.93	1503	2.90
38.0	1.90	1.85	1486	2.74
40.0	1.92	1.87	1493	2.79
42.0	1.94	1.88	1485	2.80
44.0	1.84	1.79	1471	2.63
46.0	1.89	1.83	1473	2.70
48.0	1.95	1.89	1493	2.83
50.0	1.95	1.89	1494	2.83
52.0	1.89	1.83	1499	2.75
54.0	1.98	1.93	1507	2.90
56.0	1.90	1.84	1492	2.74
58.0	1.92	1.87	1485	2.77
60.0	1.94	1.88	1495	2.82
62.0	1.94	1.88	1493	2.81
64.0	1.91	1.85		
66.0	1.84	1.78		
68.0	1.87	1.82		
70.0	1.87	1.81		
72.0	1.84	1.78		
74.0	1.89	1.84		
76.0	1.84	1.78		
78.0	1.91	1.85		
80.0	1.90	1.84		
82.0	1.88	1.82		
84.0	1.32	1.26		
86.0	1.96	1.90		
88.0	1.96	1.90		
90.0	1.89	1.84		
92.0	1.71	1.66		
94.0	1.91	1.85		
96.0	1.91	1.85		
98.0	1.84	1.78		
100.0	1.89	1.83		
102.0	1.86	1.80		

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
104.0	1.86	1.80		
106.0	1.83	1.78		
108.0	1.81	1.75		
110.0	1.84	1.79		
112.0	1.84	1.79		
114.0	1.82	1.77		
116.0	1.83	1.77		
118.0	1.84	1.78		
120.0	1.81	1.75		
122.0	1.81	1.75		
124.0	1.75	1.70		
126.0	1.78	1.72		
128.0	1.86	1.80		
130.0	1.82	1.76		
132.0	1.83	1.78		
134.0	1.89	1.83		
136.0	1.98	1.92		
138.0	1.93	1.87		
140.0	1.94	1.88		
142.0	1.82	1.76		
144.0	1.83	1.77		
146.0	1.81	1.75		
148.0	1.78	1.72		
150.0	1.76	1.70		
152.0	1.78	1.72		
154.0	1.79	1.73		
156.0	1.80	1.74		
158.0	1.79	1.74		
160.0	1.81	1.75		
162.0	1.81	1.75		
164.0	1.85	1.79		
166.0	1.87	1.81		
168.0	1.85	1.80		
170.0	1.85	1.79		
172.0	1.81	1.76		
174.0	1.86	1.80		
176.0	1.81	1.75		
178.0	1.82	1.76		
180.0	1.84	1.78		
182.0	1.82	1.76		
184.0	1.87	1.81		
186.0	1.91	1.85		
188.0	1.84	1.79		
190.0	1.89	1.84		
192.0	1.90	1.85		
194.0	1.83	1.78		
196.0	1.80	1.74		
198.0	1.85	1.80		
200.0	1.86	1.81		
202.0	1.74	1.69		
204.0	1.79	1.73	1521	2.63
206.0	1.82	1.76	1527	2.69
208.0	1.83	1.78	1513	2.69
210.0	1.84	1.78	1529	2.73

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
212.0	1.82	1.76	1526	2.69
214.0	1.83	1.77	1513	2.69
216.0	1.77	1.72	1506	2.59
218.0	1.86	1.80	1511	2.73
220.0	1.85	1.79	1508	2.70
222.0	1.92	1.86	1518	2.82
224.0	1.91	1.86	1515	2.81
226.0	1.91	1.85	1530	2.83
228.0	1.89	1.83	1530	2.81
230.0	1.89	1.84	1540	2.83
232.0	1.91	1.85	1515	2.81
234.0	1.96	1.90	1525	2.90

KW-PE-GC-289

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
0.0	1.88	1.83		
2.0	1.97	1.92	1479	2.83
4.0	1.93	1.87	1491	2.79
6.0	1.88	1.83	1494	2.73
8.0	1.87	1.82	1492	2.71
10.0	1.85	1.79	1485	2.66
12.0	1.84	1.79	1490	2.66
14.0	1.92	1.87	1504	2.81
16.0	1.92	1.87	1500	2.80
18.0	1.94	1.88	1503	2.82
20.0	1.89	1.83	1492	2.74
22.0	1.93	1.88	1506	2.83
24.0	1.90	1.84	1504	2.77
26.0	1.99	1.93	1498	2.89
28.0	1.95	1.89	1509	2.85
30.0	1.94	1.89	1502	2.83
32.0	1.97	1.91	1497	2.87
34.0	2.01	1.95	1511	2.95
36.0	2.04	1.98	1505	2.98
38.0	2.00	1.94	1527	2.96
40.0	1.97	1.91	1506	2.87
42.0	1.94	1.88	1471	2.77
44.0	1.93	1.87	1473	2.76
46.0	1.94	1.88	1477	2.78
48.0	1.97	1.91	1480	2.83
50.0	1.98	1.92	1486	2.86
52.0	2.01	1.95	1490	2.91
54.0	1.95	1.89	1468	2.78
56.0	1.99	1.93	1462	2.83
58.0	1.90	1.84	1454	2.67
60.0	1.94	1.88	1458	2.74
62.0	1.90	1.84	1457	2.68
64.0	1.97	1.91	1475	2.82
66.0	1.94	1.89	1453	2.74
68.0	1.89	1.83	1462	2.67
70.0	1.97	1.91	1485	2.84
72.0	1.95	1.89	1464	2.76
74.0	1.95	1.90	1467	2.78
76.0	1.91	1.85	1458	2.70
78.0	1.97	1.91	1497	2.87
80.0	1.89	1.84	1456	2.67
82.0	1.87	1.81	1455	2.64
84.0	1.89	1.84	1464	2.69
86.0	1.92	1.86	1464	2.72
88.0	1.92	1.87	1472	2.75
90.0	1.82	1.77		
92.0	1.99	1.93	1465	2.83
94.0	1.92	1.86	1487	2.77
96.0	1.90	1.85	1472	2.72
98.0	1.97	1.91		
100.0	1.96	1.91	1493	2.85

Depth (cm)	Boyce corrected gamma density (g/cm^3)	Pycnometer cal. Boyce corr. den. (g/cm^3)	20 deg. C Vp (m/s)	Impedance (g/cm2s x 105)
102.0	1.97	1.91	1484	2.84
104.0	1.96	1.90	1485	2.83
106.0	2.00	1.94	1491	2.89
108.0	1.89	1.83	1499	2.74
110.0	1.91	1.85	1472	2.72
112.0	1.98	1.92	1491	2.86
114.0	1.96	1.91	1482	2.82
116.0	1.92	1.87	1473	2.75
118.0	1.97	1.91	1482	2.83
120.0	1.91	1.86	1484	2.75
122.0	1.99	1.93	1511	2.91
124.0	1.96	1.91	1514	2.89
126.0	1.97	1.91	1489	2.85
128.0	1.94	1.89	1498	2.83
130.0	1.84	1.78		
132.0	1.85	1.79	1495	2.68
134.0	1.87	1.82	1501	2.72
136.0	1.84	1.78	1484	2.65
138.0	1.82	1.77	1486	2.62
140.0	1.89	1.83	1509	2.76
142.0	1.90	1.84	1515	2.79
144.0	1.87	1.81	1516	2.75
146.0	1.89	1.83	1516	2.78
148.0	1.91	1.85	1506	2.79
150.0	1.91	1.85	1512	2.80
152.0	1.85	1.80	1507	2.71
154.0	1.81	1.75	1484	2.60
156.0	1.79	1.73		
158.0	1.89	1.83	1503	2.75
160.0	1.89	1.84	1500	2.76
162.0	1.97	1.92	1504	2.88
164.0	1.93	1.88	1510	2.83
166.0	1.93	1.88	1508	2.83
168.0	1.88	1.82	1489	2.71
170.0	1.98	1.92	1518	2.92
172.0	2.00	1.94	1524	2.96
174.0	1.95	1.89	1538	2.91

3.3 Little ISSAMS and DIAS Measurements (Lavoie)

Boca Raton

Little ISSAMS (probe depths fixed at 30 cm bsf) and DIAS were deployed four times in each of 7 locations during the Boca Raton site characterization. Station locations can be found in Fig. 1.1.2 and a summary of actual values on Table 3.3.1 and 3.3.2.

Lower Florida Keys

Fig 3.3.3 represents a compilation of shear wave velocity from the Lower Florida Keys as a function of depth measured using DIAS, GISSAMS (gradient system) and ISSAMS (fixed depths). These data represent numerous deployments of each system. Average values can be found in Table 3.3.3.

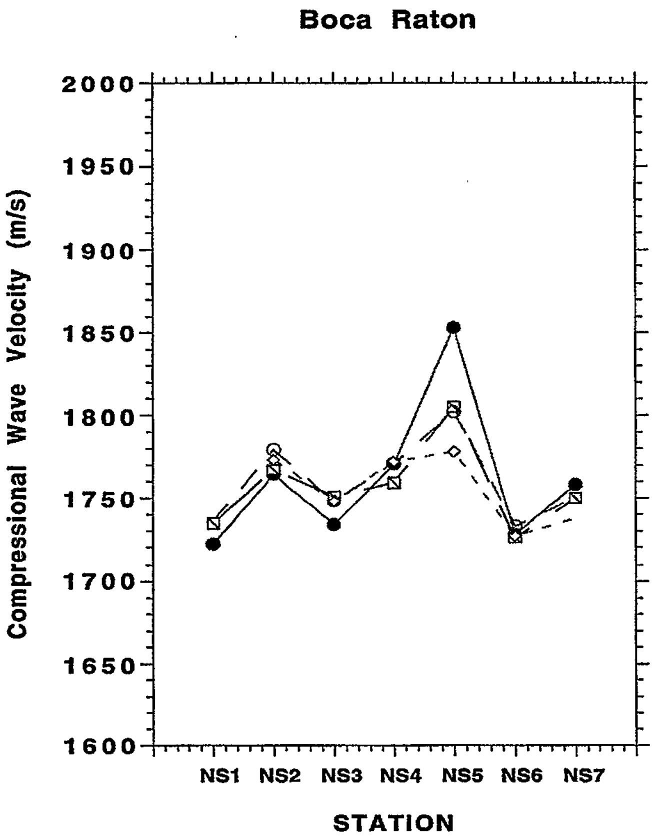


Figure 3.3.1. Compressional wave velocity measured at four closely-spaced locations within each of seven Boca Raton stations. High values reflect increased grain size and shell content.

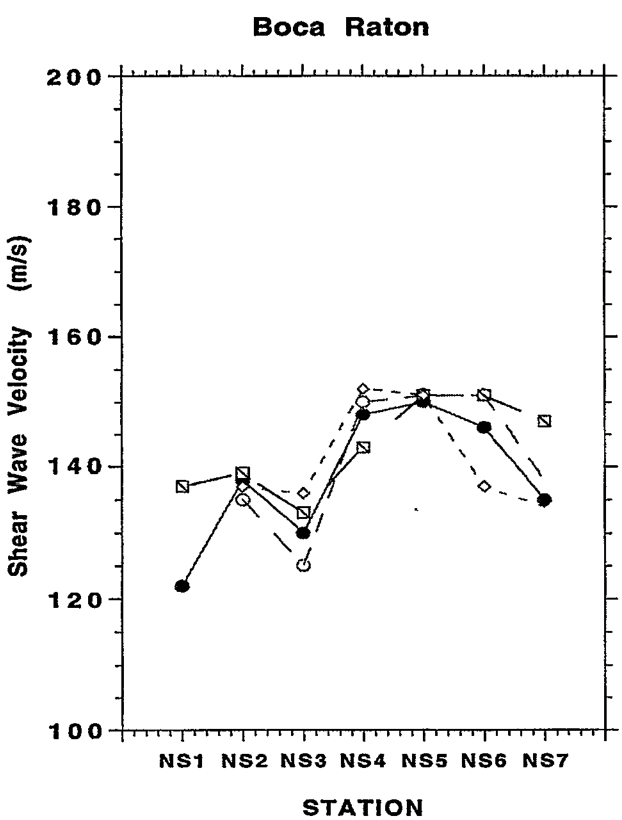


Figure 3.3.2. Shear wave velocity measured using ISSAMS probes at the same four locations (as above) within each of seven Boca Raton stations. Shear wave velocity measured using the DIAS system agree with ISSAMS and are not shown.

Table 3.3.1. Compressional Wave Velocity measured at seven Boca Raton stations.

NS1	1722.00	1735.00	1736.00	
NS2	1764.00	1767.00	1779.00	1773.00
NS3	1734.00	1751.00	1748.00	1748.00
NS4	1770.00	1759.00	1771.00	1772.00
NS5	1853.00	1805.00	1802.00	1778.00
NS6	1728.00	1726.00	1733.00	1727.00
NS7	1758.00	1750.00	1750.00	1738.00

Table 3.3.2. Shear Wave Velocity measured at seven Boca Raton stations.

NS1	122.00	137.00		
NS2	138.00	139.00	135.00	137.00
NS3	130.00	133.00	125.00	136.00
NS4	148.00	143.00	150.00	152.00
NS5	150.00	151.00	151.00	151.00
NS6	146.00	151.00	151.00	137.00
NS7	135.00	147.00	138.00	134.00

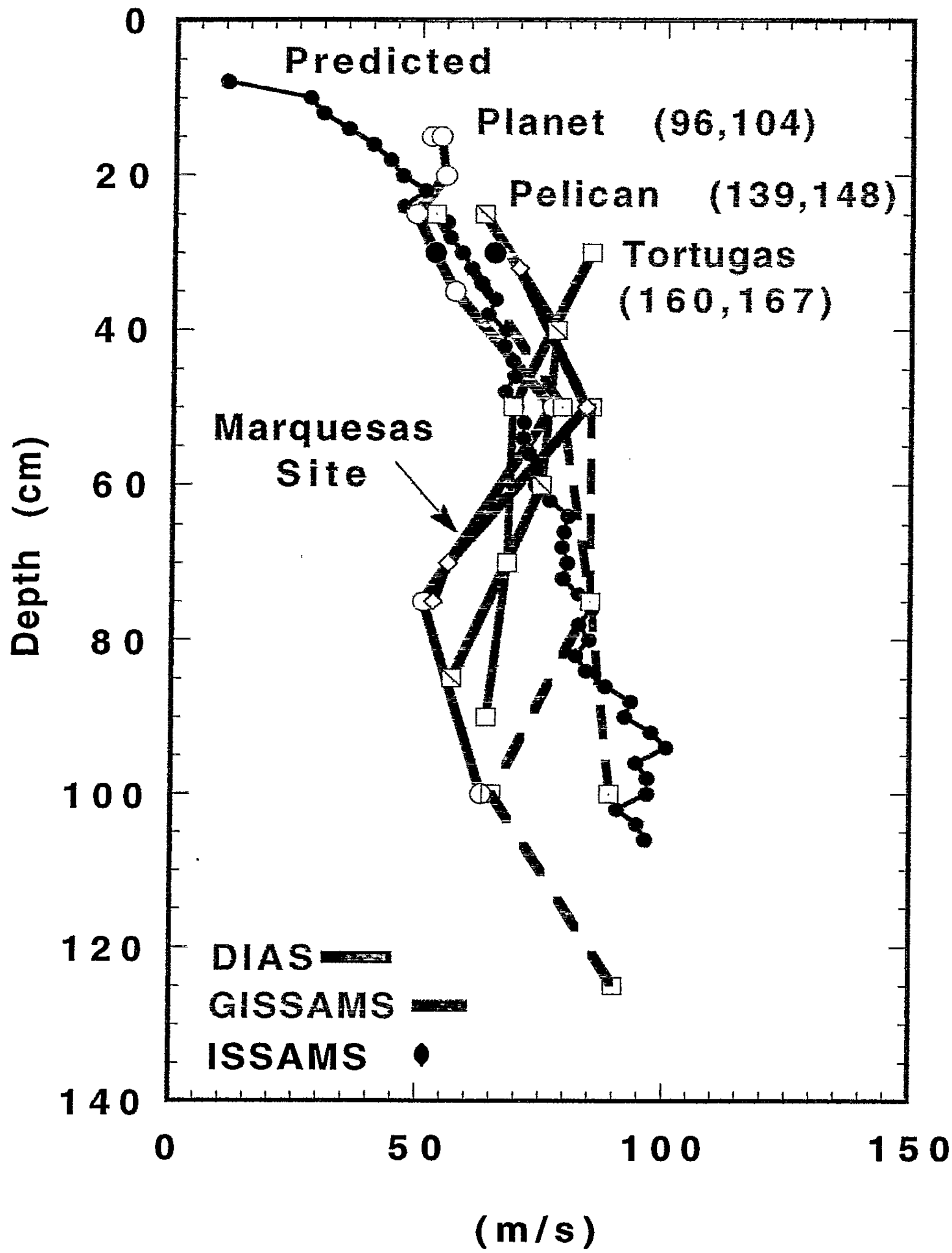


Figure 3.3.3 In-situ shear wave velocities measured ath the Dry Tortugas and Marquesas sites.

Table 3.3.3 Lower Floida Keys in-situ geoacoustic data.

SITE ID	Depth of Insertion (cm)	G (N/m^2)	Vs (m/s)
DRY TORTUGAS			
SITE 139	25	6.52×10^6	63
	40	1.01×10^7	78
SITE 148	60	9.18×10^6	75
	85	5.30×10^6	57
SITE 160	30	1.18×10^7	85
	50	7.82×10^6	69
SITE 169	70	7.53×10^6	68
	90	6.66×10^6	64
MARQUESAS			
SITE 185	30	8.48×10^6	72
		8.48×10^6	72
	50	1.16×10^7	84
		1.15×10^7	83
	70	5.14×10^6	56
SITE 196	75	4.65×10^6	53
		4.98×10^6	55
		3.03×10^6	43
		3.00×10^6	43

3.4 **Microfabric Analysis** (Stephens, Furukawa, and Lavoie)

Microfabric Image Analysis has been performed on photomicrographs of samples from Boca Raton and the Dry Tortugas. Section 3.4.1 contains a sample image (Figures 3.4.1.1) and analysis results from Boca Raton core NS05-3 thin section photomicrographs. A comparison of the image analysis-calculated porosity and measured bulk porosity is illustrated in Figure (3.4.1.2).

Section 3.4.2 contains a sample scanning electron microscope photomicrograph image from the Dry Tortugas (Figure 3.4.2.1). Problems associated with performing image analysis on these images includes the following: 1) image analysis software programs cannot define grain boundaries of particles when a wide range of particle sizes exist as in Figure 3.4.2.1., 2) Brightness and contrast vary from image to image making image analysis automation difficult, and 3) problems with scale exist. At low magnification particles may appear to be solid; however, at higher magnification, it is evident that many apparently solid particles have significant pore space. For example, *Halimeda* plates (Figure 3.4.2.1 and 3.4.2.2) have up to 30% intraparticle pore space. Section 3.4.2 also contains a sample transmission electron photomicrograph image (Figure 3.4.2.2) and analysis results (Table 4.4.2.1). Figure 3.4.2.2 is within a *Halimeda* plate. At low magnification, the plate appears to be a solid particle and not the complex arrangement of aragonite needles it actually is.

3.4.1 **Boca Raton Microfabric:** NS05-3

Figure 3.4.1.1 illusrates typical Boca Raton Microfabric. The sediment consists of a mix of terrigenous carbonate-siliciclastic sands. To the right of the image is a corresponding thresholded image. The image on the left is the actual thin section photomicrograph and the image on the right is a boolean (pixels have a value of either 0, black, or 1, white) image on which image analysis was performed. Table 3.4.1.1 contains the results of the image analysis results using the Image Analysis software Image Tool. Figure 3.4.1.2 is a depth profile comparing image analysis calculated porosity and measured porosity.

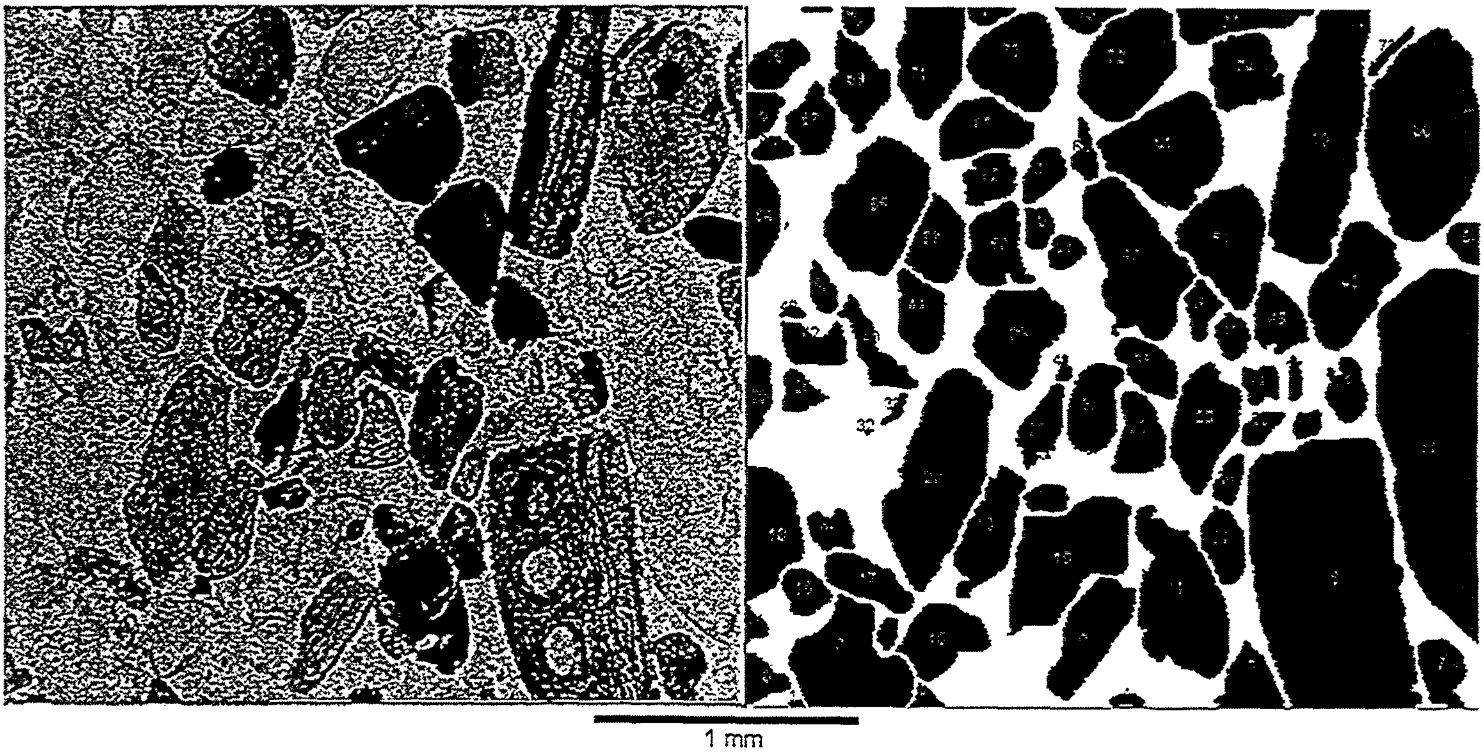
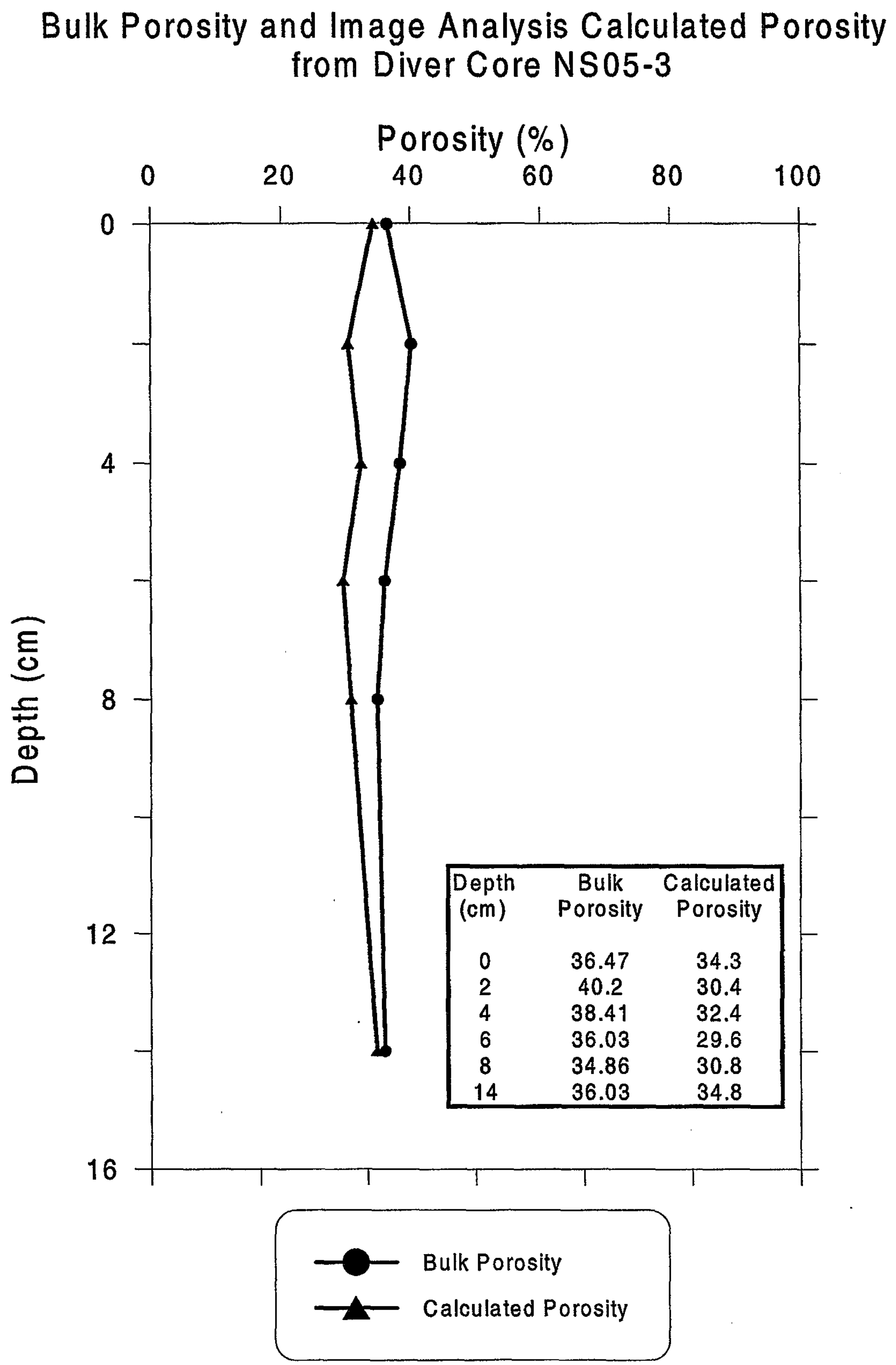


Figure 3.4.1.1 Thin Section Photomicrograph and Boolean Image



Depth (cm)	Bulk Porosity	Calculated Porosity
0	36.47	34.3
2	40.2	30.4
4	38.41	32.4
6	36.03	29.6
8	34.86	30.8
14	36.03	34.8

Figure 3.4.1.2 Image Analysis versus Measured Bulk Porosity

Table 3.4.1.1 Boca Raton image analysis data for NS-05-3.

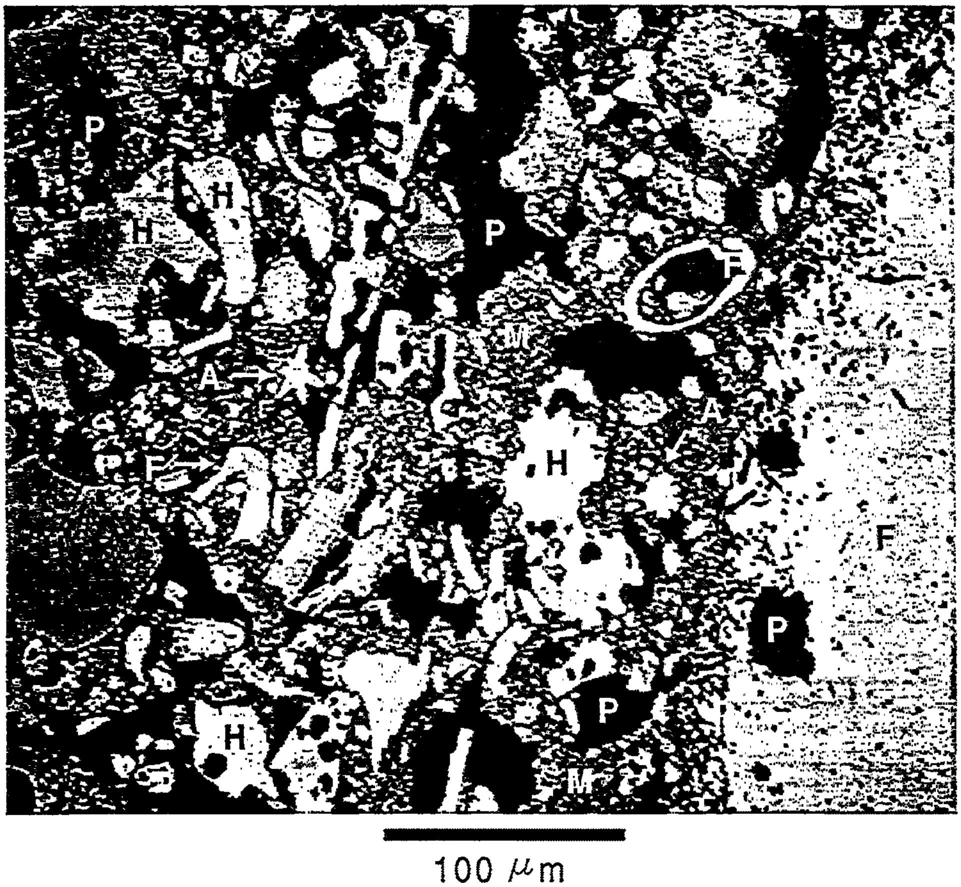
NS05-3 (8-10)cm

	Object	Area	Perimeter	Major Axis Length	Major Axis Angle	Minor Axis Length	Minor Axis Angle	Elongation	Roundness	Feret Diameter	Compactness
Mean		2395.68	185.97	66.89	12.01	36.71	-6.68	1.92	0.67	47.1	0.73
Std. Dev.		3349.5	120.95	46.65	63.57	21.38	39.14	0.81	0.15	29.08	0.11
	#1	17549	572.25	202.71	-59.13	109.42	30.78	1.85	0.67	149.48	0.74
	#2	1213	154.05	54.08	-56.31	31.62	34.7	1.71	0.64	39.3	0.73
	#3	2629	240.45	91.02	54.39	35.81	-35.91	2.54	0.57	57.86	0.64
	#4	2105	199.17	64.5	7.13	50.36	-83.16	1.28	0.67	51.77	0.8
	#5	5057	348.49	125.92	-67.1	60.93	23.2	2.07	0.52	80.24	0.64
	#6	17394	657.92	271.11	-80.02	85.33	10.12	3.18	0.5	148.82	0.55
	#7	259	65.28	23.41	70.02	13.93	-21.04	1.68	0.76	18.16	0.78
	#8	4903	321.34	119.97	50.07	58.9	-40.18	2.04	0.6	79.01	0.66
	#9	812	115.91	36.89	-32.83	29.68	57.38	1.24	0.76	32.15	0.87
	#10	1482	173.78	68.1	-29.95	26.42	60.52	2.58	0.62	43.44	0.64
	#11	2395	253.55	94.92	69.66	35.11	-19.98	2.7	0.47	55.22	0.58
	#12	6941	394.43	155.91	78.91	58.05	-10.92	2.69	0.56	94.01	0.6
	#13	1206	142.81	54.13	-78.27	30.59	11.31	1.77	0.74	39.19	0.72
	#14	705	112.33	37.74	-32.01	29.68	57.38	1.27	0.7	29.96	0.79
	#15	490	90.94	30.08	-15.42	19.65	-104.74	1.53	0.74	24.98	0.83
	#16	521	97.6	36.4	74.05	17.72	-16.39	2.05	0.69	25.76	0.71
	#17	2885	240.38	91.55	83.73	44.28	-6.48	2.07	0.63	60.61	0.66
	#18	1534	170.98	58.19	-70.94	37.95	18.43	1.53	0.66	44.19	0.76
	#19	1105	173.37	63.32	68.7	26	-22.62	2.44	0.46	37.51	0.59
	#20	1822	185.37	64.56	73.81	34.48	-16.86	1.87	0.67	48.16	0.75
	#21	456	88.6	34.67	33.23	17.2	-54.46	2.02	0.73	24.1	0.7
	#22	324	69.04	25	53.13	18.6	-36.25	1.34	0.85	20.31	0.81
	#23	16	11.66	4.12	75.96	3.16	-18.43	1.3	1.48	4.51	1.09
	#24	175	67.94	27.8	52.31	7.81	-39.81	3.56	0.48	14.93	0.54
	#25	975	144.12	45.54	-81.16	29.27	7.85	1.56	0.59	35.23	0.77
	#26	606	110.25	33.62	-30.38	27.78	59.74	1.21	0.63	27.78	0.83
	#27	572	100.53	32.02	-38.66	29.21	51.95	1.1	0.71	26.99	0.84
	#28	253	71.8	31.06	-86.31	7	0	4.44	0.62	17.95	0.58
	#29	1206	146.64	54.49	-47.23	29	43.6	1.88	0.7	39.19	0.72
	#30	3014	225.89	72.57	78.07	56.29	-12.31	1.29	0.74	61.95	0.85
	#31	1213	200.75	78.82	-54.29	23.6	36.38	3.34	0.38	39.3	0.5
	#32	136	48.97	18.68	74.48	9.49	-18.43	1.97	0.71	13.16	0.7

#33	1070	148.91	51.11	-30.58	31.38	59.35	1.63	0.61	36.91	0.72
#34	585	96.91	33.24	-83.09	23.19	7.43	1.43	0.78	27.29	0.82
#35	1507	165.47	61.98	-72.15	32.57	17.88	1.9	0.69	43.8	0.71
#36	1318	161.44	50.45	-76.24	36.14	14.42	1.4	0.64	40.96	0.81
#37	3476	258.18	91.92	75.51	46.57	-14.93	1.97	0.66	66.53	0.72
#38	5013	339.95	117.72	-73.72	63.6	16.44	1.85	0.55	79.89	0.68
#39	668	113.23	42.19	84.56	26.08	-4.4	1.62	0.65	29.16	0.69
#40	119	43.21	17.12	6.71	8.06	-82.87	2.12	0.8	12.31	0.72
#41	486	91.6	37.64	-73.01	17.72	16.39	2.12	0.73	24.88	0.66
#42	3468	252.62	87.05	91.97	61.03	1.88	1.43	0.68	66.45	0.76
#43	1874	199.78	62.03	69.23	48.1	-20.7	1.29	0.59	48.85	0.79
#44	1748	176.27	63.51	97.24	40.31	7.13	1.58	0.71	47.18	0.74
#45	4766	279.59	95.13	86.99	66.07	-2.6	1.44	0.77	77.9	0.82
#46	473	85.01	27.29	28.44	21.95	-59.93	1.24	0.82	24.54	0.9
#47	8028	454.59	178.76	75.42	51.66	-14.57	3.46	0.49	101.1	0.57
#48	496	90.7	30.36	-72.76	17.72	16.39	1.71	0.76	25.13	0.83
#49	8913	396.85	147.36	82.2	83.73	-7.55	1.76	0.71	106.53	0.72
#50	4432	281.91	85.29	-4.71	80.31	85	1.06	0.7	75.12	0.88
#51	1026	143.5	44.05	50.53	34.83	-39.17	1.26	0.63	36.14	0.82
#52	775	117.15	43.42	61.07	25.06	-28.61	1.73	0.71	31.41	0.72
#53	484	116.01	43.74	-79.46	17.26	10.01	2.53	0.45	24.82	0.57
#54	368	77.7	28.86	14.04	15.52	-75.07	1.86	0.77	21.65	0.75
#55	1967	183.71	66.48	21.16	36.4	-69.08	1.83	0.73	50.04	0.75
#56	1159	140.47	50.99	78.69	33.73	-11.98	1.51	0.74	38.41	0.75
#57	1793	192.75	70.61	-77.74	42.95	12.09	1.64	0.61	47.78	0.68
#58	2880	227.47	81.34	69.11	48.1	-20.7	1.69	0.7	60.56	0.74
#59	3681	238.72	85.7	55.94	54.08	-33.69	1.58	0.81	68.46	0.8
#60	3014	221.48	67.6	82.35	61.52	-7.47	1.1	0.77	61.95	0.92
#61	2104	191.95	58.52	56.85	57.14	-32.86	1.02	0.72	51.76	0.88
#62	1013	130.4	45.62	26	27.73	-64.36	1.65	0.75	35.91	0.79
#63	271	102.12	43.93	48.69	7.81	-39.81	5.62	0.33	18.58	0.42

3.4.2 Dry Tortugas Microfabric: KW-PE-GC-147
KW-PE-GC-225

Figure 3.4.2.1 shows typical Dry Tortugas microfabric. The sample, KW-PE-GC-147 (88-90)cm, consists of a variety of microfossils and other calcium carbonate grains. Image analysis was performed to determine the porosity of the sediment. The iamage analysis determined porosity is 40.6% which compares well to the measured bulk porosity of 42.7%. Figure 3.4.2.2 , KW-PE-GC-225 (2-4)cm, is a high magnification image of a *Halimeda* plate which consists of aragonite needles usually less than one micron in length.



Halimeda Plates (H) Shell Fragments (F)
Pore Space **(P)** Aragonite Stars (A)
Matrix (M)

Figure 3.4.2.1 Typical fabric of the Dry Tortugas Test Site

Figure 3.4.2.2: Dry Tortugas TEM microfabric

Table 3.4.2.1

KW-PE-GC-225 (3 cm)

	Object	Area	Perimeter	Major Axis Length	Major Axis Angle	Minor Axis Length	Minor Axis Angle	Elongation	Roundness	Bounding Box	Feret Diameter	Compactness
Mean		1111.53	143	56.61	-13.96	22.63	8.96	2.77	0.61	1496.37	34.44	0.63
Std. Dev.		977.11	69.54	27.41	56.23	12.12	44.82	1.12	0.15	1382.79	15.29	0.11
	#1	881	148.85	61.29	61.76	16.12	-29.74	3.8	0.5	988.34	33.49	0.55
	#2	338	79.84	33.53	-72.65	12.65	18.43	2.65	0.67	424.08	20.74	0.62
	#3	452	98.08	40.8	-72.9	15.81	18.43	2.58	0.59	645.17	23.99	0.59
	#4	867	132.84	56.29	-77.69	19.42	11.89	2.9	0.62	1093.03	33.22	0.59
	#5	3409	264.68	102.53	-20.56	38.63	68.75	2.65	0.61	3960.29	65.88	0.64
	#6	204	61.21	26.08	-4.4	9.06	83.66	2.88	0.68	236.14	16.12	0.62
	#7	360	81.33	34.41	-54.46	11.4	37.87	3.02	0.68	392.33	21.41	0.62
	#8	2969	270.84	104.89	-48.87	39.7	40.91	2.64	0.51	4164.03	61.48	0.59
	#9	313	86.74	35.85	22.99	13	-67.38	2.76	0.52	466.01	19.96	0.56
	#10	91	34.97	13.15	81.25	7.07	-8.13	1.86	0.94	93.01	10.76	0.82
	#11	356	68.38	23.6	-53.62	20.81	35.22	1.13	0.96	491.1	21.29	0.9
	#12	1018	171.14	74.25	-25.53	15.65	63.43	4.74	0.44	1162.19	36	0.48
	#13	1013	138.33	52.2	-69.83	28.79	20.32	1.81	0.67	1503.01	35.91	0.69
	#14	656	129.01	53.24	84.61	18.11	-6.34	2.94	0.5	964.13	28.9	0.54
	#15	559	109.54	46.62	-35.39	14.42	56.31	3.23	0.59	672.3	26.68	0.57
	#16	1042	141.3	51.66	-47.35	28.32	42.14	1.82	0.66	1463.06	36.42	0.71
	#17	579	149.94	68.73	-81.63	12.17	9.46	5.65	0.32	836.15	27.15	0.4
	#18	2756	233.28	89.55	-66.3	34.93	23.63	2.56	0.64	3128	59.24	0.66
	#19	1811	240.35	95.21	53.97	21.4	-37.41	4.45	0.39	2037.59	48.02	0.5
	#20	1259	146.57	56.22	-5.1	28.07	-94.09	2	0.74	1578.25	40.04	0.71
	#21	963	123.3	43.17	-76.61	34.93	13.24	1.24	0.8	1508.01	35.02	0.81
	#22	2720	257.87	96.26	-42.47	48.84	47.49	1.97	0.51	4701	58.85	0.61
	#23	237	71.36	30.36	72.76	8.54	-20.56	3.55	0.58	259.43	17.37	0.57
	#24	1245	157.3	57.97	75	26.93	-15.07	2.15	0.63	1561	39.81	0.69
	#25	3040	227.32	83.43	-76.13	52.63	14.3	1.59	0.74	4391.12	62.21	0.75
	#26	394	99.46	42.3	6.79	13.15	98.75	3.22	0.5	556.32	22.4	0.53
	#27	206	68.04	27.89	14.53	7.28	-74.05	3.83	0.56	203.06	16.2	0.58
	#28	1307	169.38	70.71	28.74	21.47	-62.24	3.29	0.57	1518.22	40.79	0.58
	#29	2260	215.28	82.86	-66.53	42.54	23.55	1.95	0.61	3525	53.64	0.65
	#30	644	100.04	37.44	-55.89	26.63	34.29	1.41	0.81	997	28.64	0.76
	#31	900	125.74	49.93	32.74	21.1	-58.57	2.37	0.72	1053.27	33.85	0.68
	#32	3143	254.65	99.92	76.1	52.63	-14.3	1.9	0.61	5259.13	63.26	0.63

#33	575	117.25	49.25	84.17	14.04	-4.09	3.51	0.53	691.32	27.06	0.55
#34	1371	162.75	60.44	-38.96	31.24	50.19	1.93	0.65	1888.21	41.78	0.69
#35	267	77.25	33.12	28.89	10.3	-60.95	3.22	0.56	341	18.44	0.56
#36	286	98.95	44.05	-39.47	8.6	54.46	5.12	0.37	378.89	19.08	0.43
#37	1344	214.63	91.3	-28.81	17	61.93	5.37	0.37	1552.13	41.37	0.45
#38	2758	325.81	136.31	75.56	26.93	-15.07	5.06	0.33	3670.22	59.26	0.43
#39	1036	148.17	59.48	63	21.02	-25.35	2.83	0.59	1250.52	36.32	0.61
#40	454	88.67	35.51	-57.65	15.26	31.61	2.33	0.73	542.05	24.04	0.68
#41	442	97.05	40.46	-39.99	12.04	48.37	3.36	0.59	487.2	23.72	0.59
#42	903	121.2	41.23	22.83	30.46	-66.8	1.35	0.77	1256.03	33.91	0.82
#43	3851	311.83	121.84	20.67	39.56	-69.27	3.08	0.5	4820	70.02	0.57
#44	382	86.23	32.7	-66.57	13	22.62	2.52	0.65	425.04	22.05	0.67
#45	661	137.64	50	73.74	22.8	-15.26	2.19	0.44	1140.18	29.01	0.58
#46	750	124.95	49.77	-22.44	17.46	66.37	2.85	0.6	869.19	30.9	0.62
#47	1154	140.71	51.92	-74.36	36.4	15.95	1.43	0.73	1890.03	38.33	0.74
#48	221	58.28	21.47	-62.24	13.42	26.57	1.6	0.82	288.06	16.77	0.78
#49	1541	157.54	59.23	-78.31	36.67	11	1.61	0.78	2172.16	44.3	0.75
#50	495	113.01	46.82	-70.02	11.7	19.98	4	0.49	548	25.1	0.54
#51	205	54.28	19.72	-59.53	13.89	30.26	1.42	0.87	274	16.16	0.82

3.5 **Mollusc Identifications** (Stephens)

Gravity Core: KW-PE-GC-215

Angel Wing
Superfamily ADESMACEA
Family PHOLADIDAE
Genus *Barnea* Risso
Barnea costata Linne'

The angel wing is common in sticky mud about a foot below the surface. Common in deep, soft sandy mud in Florida. They can live as deep as 2 feet and can move up and down in their burrows at will.

Antillean Limpet
Superfamily PATELLACEA
Family ACMAEIDAE
Subfamily ACMAEINAE
Genus *Acmaea* Eschscholtz
Subgenus *Collisella* Dall
Acmaea antillarum Sowerby

Antillean Limpets are abundant on shore rocks in the West Indies, but are rarer in Florida. Occur only in the Florida Keys.

Antillean Tusk
Family DENTALIIDAE
Genus *Dentalium* Linne'
Subgenus *Antalis* H. and A. Adams
Dentalium antillarum Orbigny

Common in shallow water.

Atlantic Thorny Oyster
Superfamily PECTINACEA
Family SPONDYLIDAE
Genus *Spondylus* Linne'
Spondylus americanus Hermann

Common.

Boring Turret
Superfamily CERITHIACEA
Family TURRITELLIDAE
Genus *Turritella* Lamarck
Subgenus *Torcula* Gray
Turritella acropora Dall

Common just offshore.

Calico Scallop
Superfamily PECTINACEA
Family PECTINIDAE
Genus *Argopecten* Monterosato
Aequipecten gibbus Linne'
Abundant in Florida a little offshore.

Common Atlantic Auger
Family TEREBRIDAE
Genus *Terebra* Bruguiere
Terebra dislocata Say
A common shallow-water species.

Coon Oyster
Superfamily OSTRACEA
Family OSTREIDAE
Genus *Ostrea* Linne'
Ostrea frons Linne'
Intertidal species.

Cross-Barred Venus
Superfamily VENERACEA
Family VENERIDAE
Subfamily CHIONINAE
Genus *Chione* Muhlfled
Subgenus *Chione* Muhlfled
Chione cancellata Linne'
A very common shallow water species in Florida.

Fargo's Worm Shell
Superfamily CERITHIACEA
Family TENAGODIDAE
Genus *Vermicularia* Lamarck
Vermicularia fargoi Olsson
Commonly found crawling on mud flats.

Florida Spiny Jewel Box
Family CHAMIDAE
Genus *Arcinella* Schumaker
Arcinella cornuta Conrad
Common from 3 to 40 fathoms and commonly washed ashore.

Florida Worm Shell
Superfamily CERITHIACEA
Family TENAGODIDAE
Genus *Vermicularia* Lamarck
Vermicularia Knorri Deshayes
Common in sponge masses, and frequently washed ashore.

Hexagonal Murex
Family MURICIDAE
Subfamily MURICINAE
Genus *Muricopsis* Bucquoy, Dautzenberg and Dollfuss
Muricopsis oxytatus (M. Smith)
A moderately common reef species.

Kitten's Paw
Superfamily PECTINACEA
Family PLICATULIDAE
Genus *Plicatula* Lamarck
Plicatula gibbosa Lamarck
A common intertidal to offshore species.

Lace Murex
Superfamily MURICACEA
Family MURICIDAE
Subfamily MURICINAE
Genus *Murex* Linne'
Subgenus *Heaxaplex* Perry
Murex florifer dilectus A Adams
It lives in a wide variety of habitats from mangrove, muddy areas to protected rocks and frequently in clear, sandy areas.

Lady-In-Waiting Venus
Superfamily VENERACEA
Family VENERIDAE
Genus *Chione* Muhfeld
Subgenus *Chione* Muhlfeld
Chione intapurpurea Conrad
Not very common. 1 to 47 fathoms.

Nucleus Scallop
Superfamily PECTINACEA
Family PECTINIDAE
Genus *Argopecten* Monterosato
Aequipecten gibbus nucleus Born
Not uncommon in the Keys from low tide to a few fathoms on grass.

Oyster Turret
Family TURRIDAE
Subfamily CLAVINAE
Genus *Pyrogospira* J. H. McLean
Pyrogospira ostrearum Stearns
Common from low water to 90 fathoms.

Rough Scallop
Superfamily PECTINACEA
Family PECTINIDAE
Genus *Aequipecten* P. Fischer
Aequipecten muscosus Wood
Moderately common just offshore to 90 fathoms.

Sanderson's Paper-bubble
Family HAMINOEIDAE
Genus *Atys* Montfort
Atys sandersoni Dall
Fairly common from shallow water to over 100 fathoms.

Smooth Tellin
Superfamily TELLINACEA
Family TELLINIDAE
Genus *Tellina* Linne'
Subgenus *Laciolina* Iredale
Tellina laevigata Linne'
Lives in sand.

Turkey Wing
Superfamily ARCACEA
Family ARCIDAE
Subfamily ARCINAE
Genus *Arca* Linne'
Arca zebra Swainson
A common species which attaches itself to rocks.

Turnip Spindle
Subfamily FUSININAE
Genus *Fusinus* Rafinesque
Subgenus *Heilprinia* Grabau
Fusinus timessus Dall
Dredged uncommonly from 20 to 50 fathoms.

Two-Lined-Melanella
Family MELANELLIDAE
Genus *Strombiformis* Da Costa
Strombiformis bilineatus Alder
Moderately common.

West Indian Worm Shell
Superfamily CERITHIACEA
Family TENAGODIDAE
Genus *Vermicularia* Lamarck
Vermicularia Spirata Philippi
Common in shallow water, the adults partially embedded in sponges and colonial ascidians. Also attaches to tree coral, *Oculina*.

White Atlantic Semele
Superfamily TELLINACEA
Family SEMELIDAE Stoliczka
Genus *Semele* Schumacher
Semele proficua Pulteney
Moderately common in shallow water.

White Bearded Ark
Superfamily ARCACEA
Family ARCIDAE
Subfamily ARCINAE
Genus *Barbatia* Gray
Barbatia candida Helbling
Common. Attached under stones.

3.6 **In-Situ Geoacoustic Measurements** (Richardson)

ISSAMS was deployed at 12 sites near the Dry Tortugas, two sites at Rebecca Shoals, and one site north of the Marquesas Keys. Station locations can be found in Figs. 3.6.1 and 3.6.2 with a summary of mean and range of values of shear and compressional wave velocity as well as compressional wave attenuation presented in table 3.6.1. Comparison of values of laboratory and in-situ geoacoustic properties to sediment physical properties are found in Tables 3.6.2 through 3.6.5. Gradients of shear and compressional wave velocity in the upper 2 m of sediment were all measured near the *Planet* site (See Fig. 3.6.2). Values are presented in tabular (Tables 3.6.6 and 3.6.7) and graphical (Figs. 3.6.3 and 3.6.4) form.

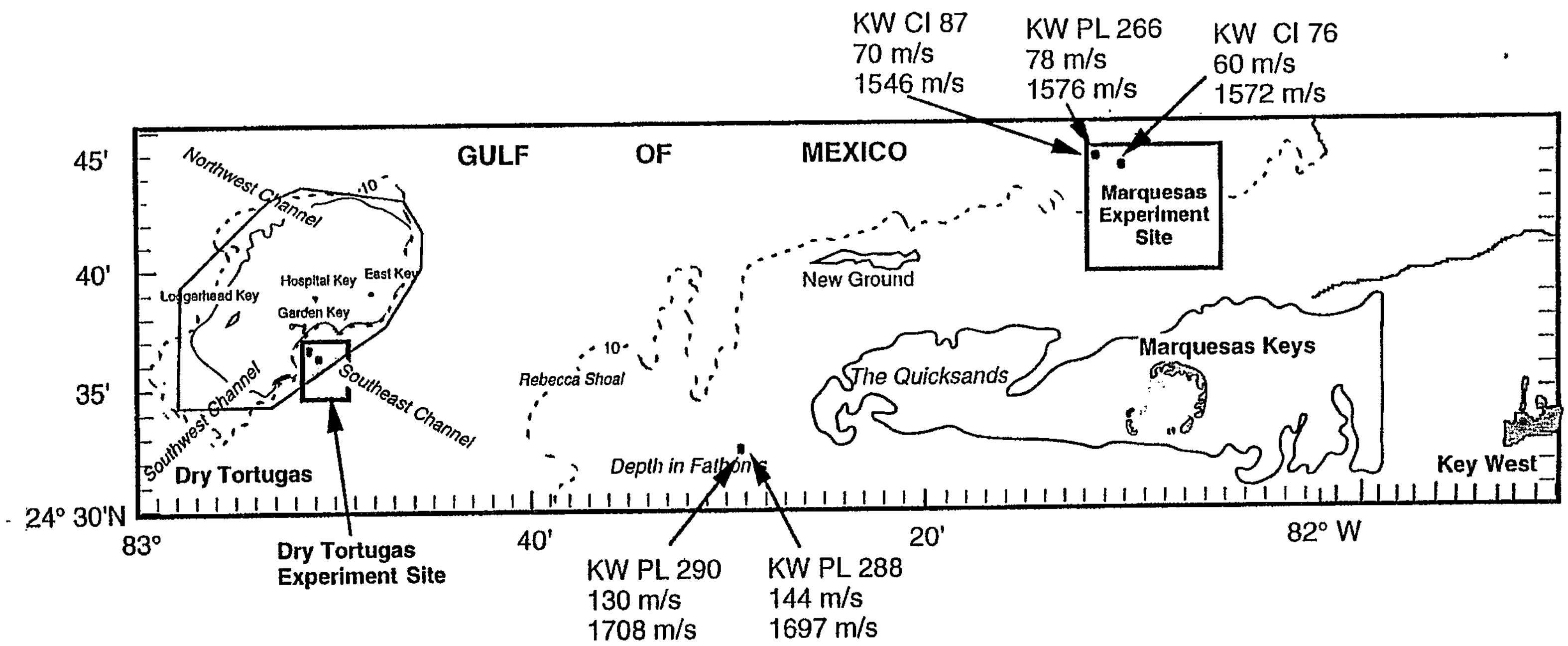


Figure 3.6.1 In-situ geoacoustic measurement locations (ISSAMS) including values of compressional and shear wave velocity (m/s) for two sites near Rebecca Shoal and one location in the Marquesas test site. Eighteen sampling locations in the Dry Tortugas test site are depicted in the next panel.

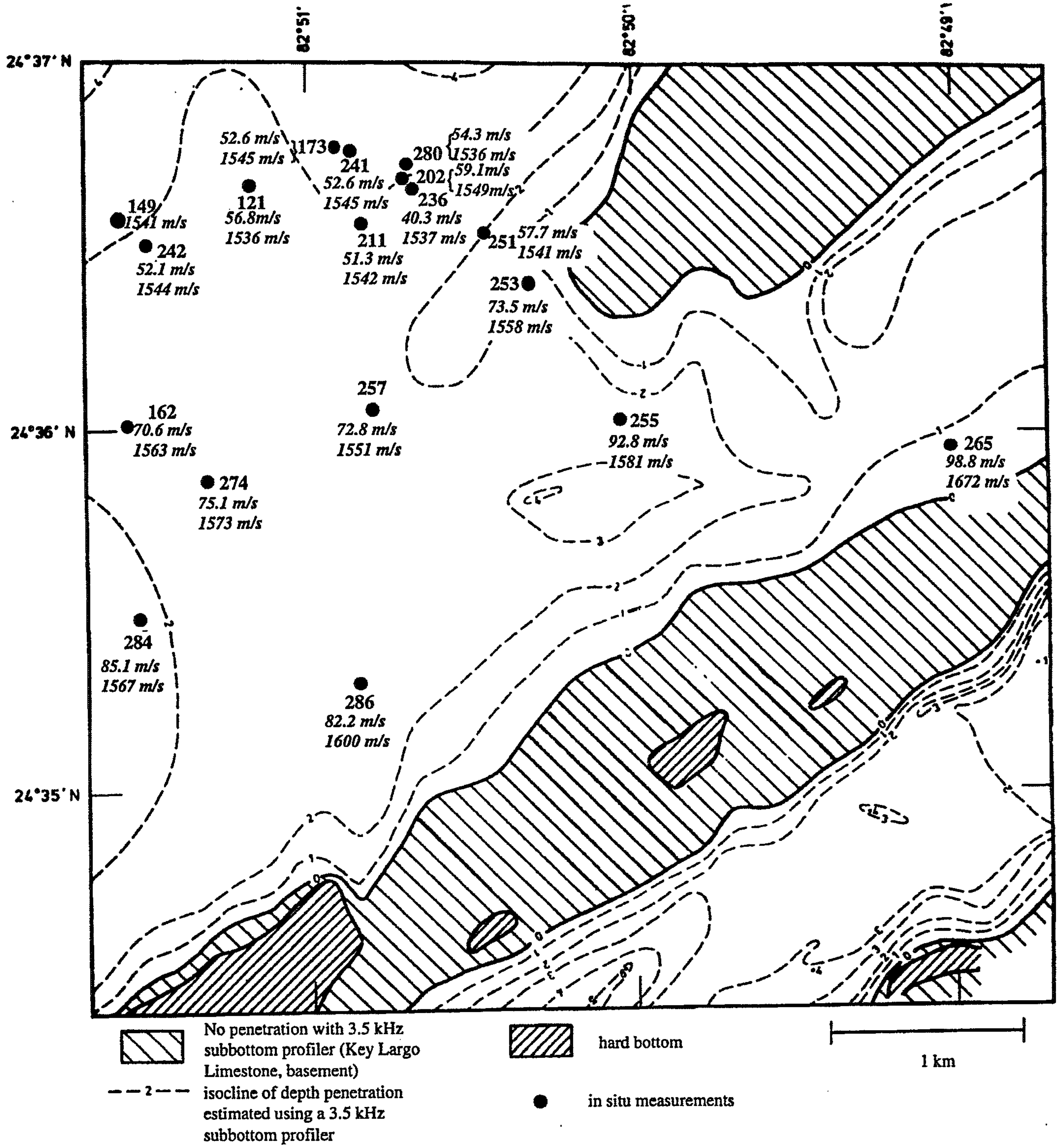


Figure 3.6.2 Shear and compressional wave velocities for sampling locations in the Dry Tortugas. The map of surface sediment thickness and locations of reef material was prpepared from 100 kHz side-scan sonar and 3.5 kHz subbottom profile data by Hannelore Fiedler of FWG (Kiel Germany).

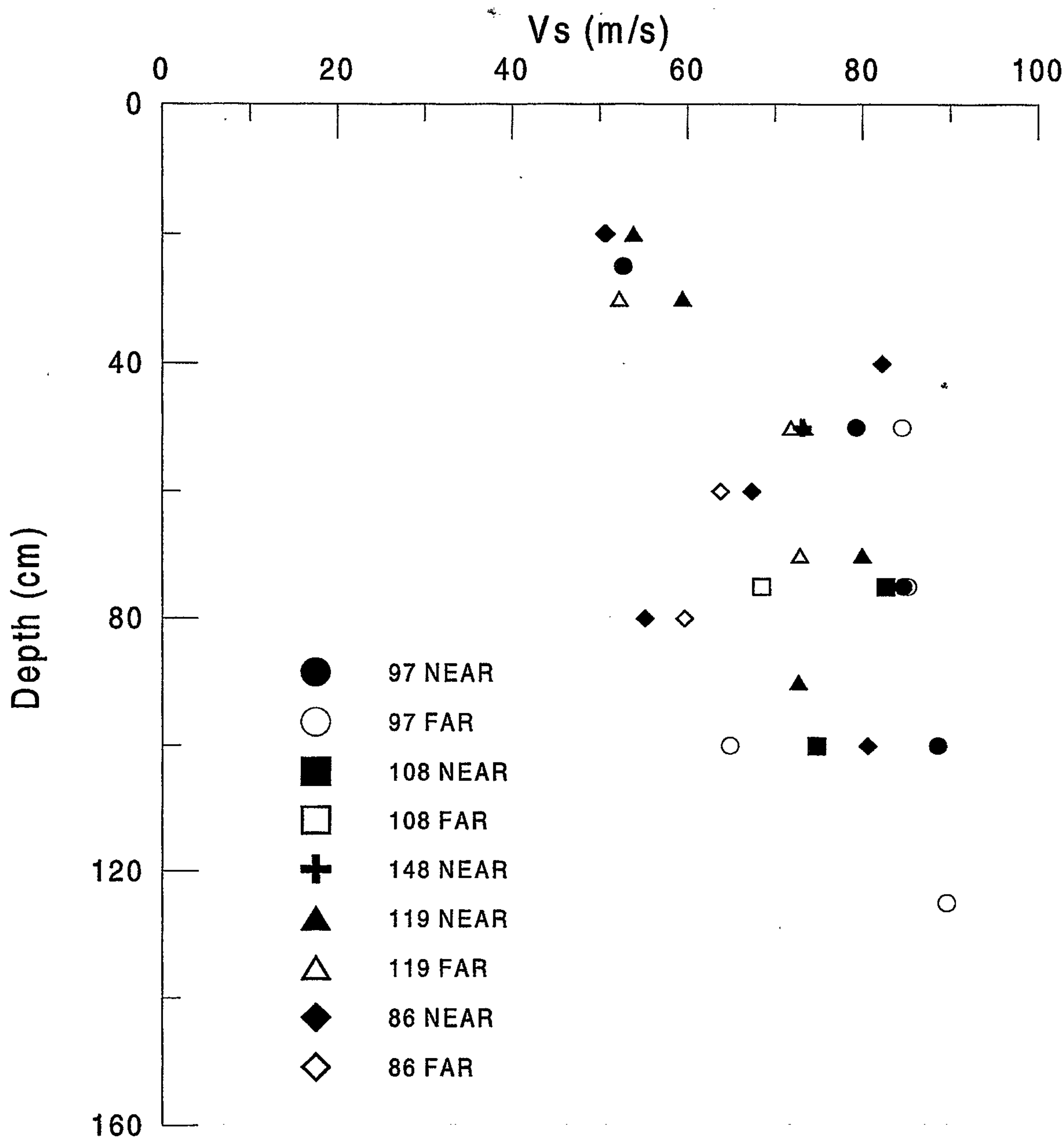


Figure 3.6.3 Gradient of shear wave velocity (m/s) from carbonate sediments at the Planet site, Dry Tortugas and NW Marquesas site (86), Marquesas Keys, Florida Keys.

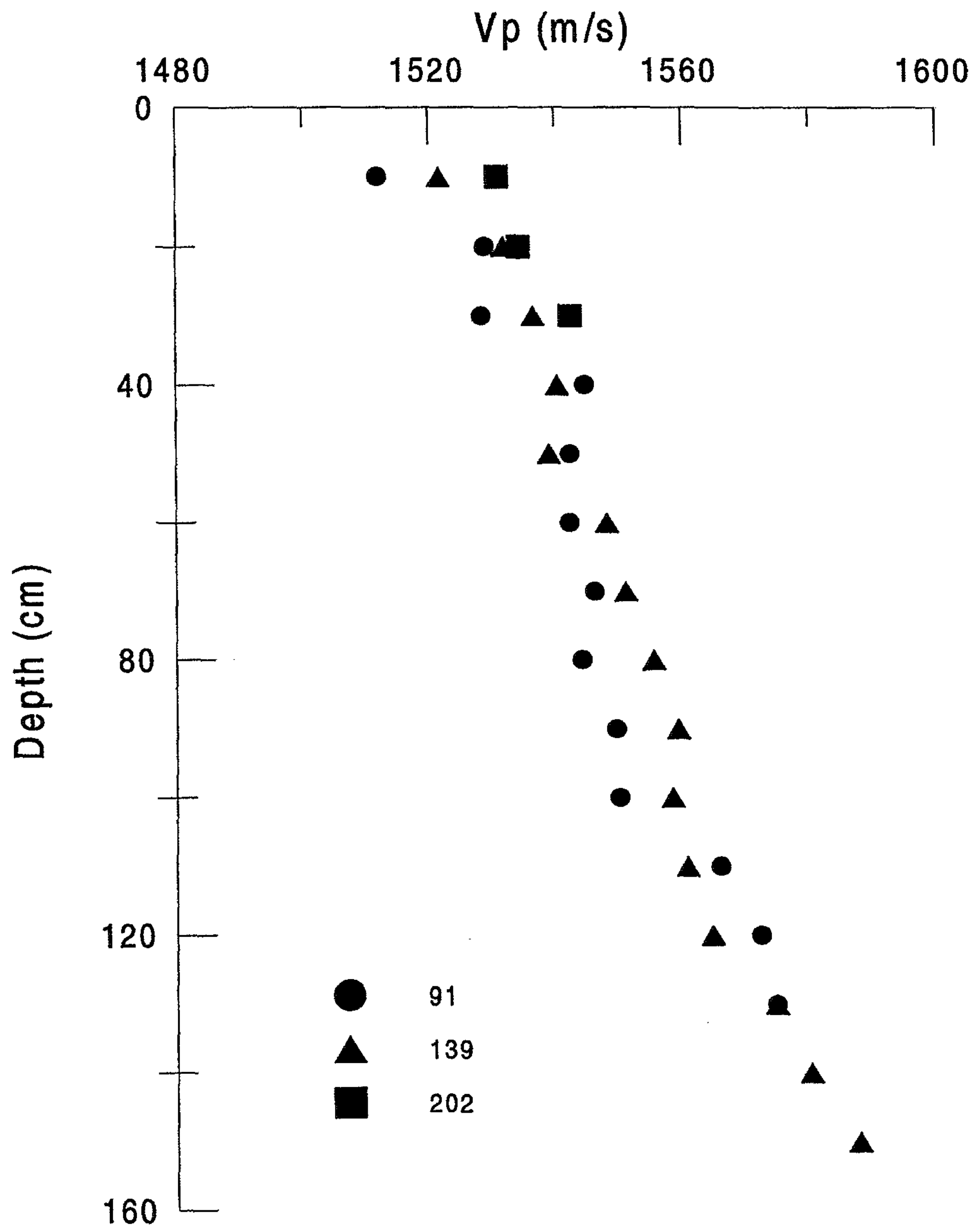


Figure 3.6.4 Gradient of compressional wave velocity (m/s) from carbonate sediments at the Planet site, Dry Tortugas, Florida Keys.

Table 3.6.1 Summary of values of in-situ sediment physical and geoacoustic properties of the Key West Campaign.

Station	Vp (m/s)	Attenuation (dB/m)	Vs (m/s)	Wet Bulk Density (g/cm^3)	Porosity (%)	Mean Grain Size (Phi)
76	1571 (1557-1587)		59.8 (53-70)	1.73 (1.52-1.83)	59.3 (53.7-70.7)	5.3 (4.7-6.7)
87	1547 (1537-1561)		70.2 (70-71)	1.73 (1.57-1.86)	59.1 (52.0-67.6)	6.3 (4.6-8.4)
121	1532 (1506-1543)		56.8 (50-68)	1.73 (1.55-1.86)	56.8 (53.4-69.4)	6.5 (6.2-7.1)
149	1541 (1533-1547)	19.1 (18-20)		1.77 (1.68-1.84)	56.6 (52.7-61.3)	5.9 (6.2-5.6)
162	1563 (1562-1564)	23.7 (23-24)	70.6 (61-76)	1.79 (1.56-1.92)	55.9 (50.9-64.4)	5.0 (5.8-4.5)
173	1536 (1534-1537)	23.1 (19-27)	55.1 (50-64)	1.75 (1.48-1.85)	59.3 (54.3-73.9)	5.6 (5.9-5.2)
202	1549 (1546-1550)	19.9 (19-23)	59.1 (50-69)	1.78 (1.55-1.87)	63.1 (57.6-70.1)	6.6 (6.2-6.9)
211	1542 (1533-1547)	19.0 (14-29)	51.3 (47-60)	1.79 (1.66-1.86)	57.5 (53.4-64.5)	6.2 (4.9-7.8)
236	1537 (1524-1555)	12.9 (10-18)	40.2 (28-56)	1.77 (1.53-1.85)	57.9 (54.4-71.0)	6.8 (6.8-6.1)
241	1545 (1526-1563)	12.7 (9-18)	52.5 (38-66)	1.77 (1.53-1.85)	57.9 (54.4-71.0)	6.8 (6.8-6.1)
242	1544 (1532-1559)	12.3 (9-17)	52.1 (46-60)	1.78 (1.55-1.87)	63.1 (57.6-70.1)	6.6 (6.2-6.9)
251	1541 (1530-1555)	14.7 (6-23)	57.7 (49-63)			6.8
253	1558 (1544-1571)	13.9 (7-18)	73.5 (62-88)			5.9
255	1581 (1566-1592)	23.2 (19-27)	92.8 (83-110)			5.2
257	1551 (1537-1562)	14.3 (9-18)	72.8 (61-97)	1.75 (1.57-1.86)	58.1 (53.7-69.0)	6.1
265	1672 (1642-1697)	28.8 (21-43)	98.8 (75-116)	2 (1.99-2.01)	45.3 (44.7-46.9)	1.1 (1.4-1.0)
266	1576 (1546-1637)	19.9 (8-35)	78.2 (51-118)	1.76 (1.66-1.87)	57.8 (51.4-63.7)	6.5 (5.8-6.8)
274	1573 (1552-1602)	15.4 (7-24)	75.1 (52-91)	1.84 (1.56-1.92)	53.2 (50.9-64.4)	6.1
280	1536 (1518-1548)	10.8 (3-16)	54.3 (39-67)	1.75 (1.51-1.87)	59.0 (53.0-72.5)	6.9 (6.4-7.5)
284	1567 (1551-1589)	14.6 (8-23)	85.1 (74-91)	1.85 (1.77-1.81)	53.8 (52.8-58.1)	5.9
286	1600 (1589-1616)	23.2 (19-28)	82.2 (77-91)			3.4
288	1697 (1668-1725)	18.1 (12-25)	143.8 (129-154)	2.02 (2.00-2.05)	43.7 (42.1-45.1)	1.3 (1.1-1.5)
290	1708 (1684-1728)	25.5 (14-33)	129.6 (123-140)	2.06 (2.00-2.09)	41.5 (39.7-45.1)	1.2 (1.3-1.9)

Table 3.6.2 Summary of near-surface sediment physical and geoacoustic properties at the Dry Tortugas site, Florida Keys.

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)	56.7	53.0-61.4	2.1
Grain Size (ϕ)	6.6	4.9-7.8	0.38
Vp (m/s)	1555	1546-1569	6
Att (dB/m @ 400 kHz)	354	298-405	29.5
IN-SITU MEASUREMENTS			
Vp (m/s)	1541	1518-1563	9.62
Att (dB/m @ 38 kHz)	12.2	3.4-23.5	3.14
Vs (m/s)	50.8	38.3-66.6	9.04

Table 3.6.3 Summary of near-surface sediment physical and geoacoustic properties at the Marquesas Keys experimental site, Florida Keys.

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)	57.8	51.4-70.1	4.76
Grain Size (ϕ)	6.2	4.6-8.4	0.96
Vp (m/s)	1551	1542-1559	4.32
Att (dB/m @ 400 kHz)	329	241-494	57.9
IN-SITU MEASUREMENTS			
Vp (m/s)	1576	1547-1637	24.3
Att (dB/m @ 38 kHz)	19.9	8.4-34.4	6
Vs (m/s)	78.2	50.7-117.8	26.4

Table 3.6.4 Summary of near-surface sediment physical and geoacoustic properties near Rebecca Shoal, Florida Keys.

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)	42.3	39.6-45.1	1.79
Grain Size (ϕ)	1.2	0.9-1.47	0.13
Vp (m/s)	1715	1645-1759	24.82
Att (dB/m @ 400 kHz)	252	103-614	102.78
IN-SITU MEASUREMENTS			
Vp (m/s)	1703	1669-1728	17.05
Att (dB/m @ 38 kHz)	22.0	11.7-33.1	6.31
Vs (m/s)	136.6	122-154	11.96

Table 3.6.5 Summary of near-surface sediment physical and geoacoustic properties at Dry Tortugas hard sand site (#256), Florida Keys.

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)	45.3	45.6-46.5	0.73
Grain Size (ϕ)	1.1	1.0-1.4	0.12
Vp (m/s)	1671	1651-1680	8.86
Att (dB/m @ 400 kHz)	319	261-512	74.57
IN-SITU MEASUREMENTS			
Vp (m/s)	1672	1643-1698	17.09
Att (dB/m @ 38 kHz)	28.8	20.6-43.2	7.19
Vs (m/s)	98.8	74.8-116.4	17.46

Table 3.6.6 Gradients of compressional wave velocity (m/s) measured using Neptune at four locations near the "PLANET" site in the Dry Tortugas, Florida Keys. Probe distances were 50 cm and the transmit frequency was 38 kHz.

Station #	KW91	KW119	KW139	KW202
Depth (cm)				
10	1511.9		1521.6	1530.9
20	1528.9		1531.8	1534.3
25		1532		
30	1528.4		1536.6	1542.6
40	1544.9		1540.5	
50	1542.5	1558	1539.1	
60	1542.5		1548.3	
70	1546.3		1551.2	
75		1627		
80	1544.4	1628	155.6	
90	1549.7		1559.4	
100	1550.2		1558.5	
110	1566.2		1560.9	
120	1572.5		1564.8	
130	1575		1574.9	
140			1580.3	
150			1588	

Table 3.6.7 Gradients of shear wave velocity (m/s) measured using GISSAMS at four locations near the "PLANET" site and one location (86) in the "NW Marquesas" site in carbonate sediments of the Florida Keys. Transmit and received probes were located 40 cm (N) and 100 cm (F).

Station #	86N	86F	97N	97F	108N	108F	119N	119F	148N
Depth (cm)									
20	50.7	50.5					53.8		
25			52.7						
30							59.4	52.2	
40	82.2								
50			79.3	84.5			73.3	71.8	73.1
60	67.3	63.7							
70							79.9	72.8	
75			84.6	85.1	82.6	68.4			
80	55.1	59.6							
90							72.6		
100	80.5		88.5	64.8	74.7				
125				89.5					

3.7 Sediment Chemistry and Mineralogy Measurements (Furukawa)

Sulfur speciation and pH

The results of aqueous sulfur speciation and pH analysis are shown in Table 3.7.1. Note that the detection limit is different for each sample due to the varied amounts of pore water samples recovered.

ICP analysis

The results of ICP analysis are shown in Table 3.7.2.

Total Organic Carbon (TOC)

The results of TOC analysis are shown in Table 3.7.3.

X-ray diffraction

The X-ray diffraction profiles of cores KW-PL-BC-141, 165, 194, 208 and KW-PL-DC-178 are shown in Figs. 3.7.1-3.7.5. The peaks indicate the presence of aragonite, HMC, LMC, and occasional minor quartz. The x-ray diffraction profiles of the gravity core, separated into clay-, silt-, and sand-sized grains, are shown in Figs. 3.7.6-3.7.8. They show the increase in the intensity of HMC peaks at depths.

Rietveld method of crystal structure refinement

The quantitative analysis using Rietveld method resulted in the HMC/LMC ratio shown in Fig. 3.7.9. The Mg contents of HMC calculated using the cell constants derived by the Rietveld method are shown in Fig. 3.7.10.

Table 3.7.1. Results of aqueous sulfur speciation and pH analysis

Core ID	Depth (cm)	Σreduced* (mM)	Intermediate** (mM)	pH
KW-PL-BC-141	1	<0.1		
	2			7.63
	6			7.69
	7	0.1		
	10			7.66
	13	<0.2		
	14			7.74
	18	0.4		7.79
	22	0.8		7.76
	26	0.2		
	30	0.9		
KW-PL-BC-165	3	<0.02		7.63
	7	<0.02		7.88
	11	<0.02		7.77
	15	<0.02		
	19	0.04		7.84
	28	0.02		
KW-PL-DC-180	1			7.53
	3		0.01	
	5			7.67
	7		0.04	
	9			7.68
	11		0.05	
	13			7.75
	15	0.11	0.06	
	17			7.71
	19		0.07	
	22			7.80
	24		0.04	
KW-PL-BC-194	3	<0.02	0.01	7.76
	7	0.04	0.03	7.57
	11	0.04	0.03	7.74
	15		0.03	7.80
	18			7.93
	19		0.03	
	22			7.82
	23	0.10		
	26			7.77
	28		<0.03	
KW-PL-BC-208	1			7.74
	5			7.72
	13			8.05
	17			7.96
	22			7.99

*Σreduced sulfur=$\Sigma[S^{2-}]+[S_2O_3^{2-}]+[SO_3^{2-}]$
**Intermediate sulfur=$[S_2O_3^{2-}]+[SO_3^{2-}]$

Table 3.7.2. The results of ICP analysis

KW-PL-BC-141								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
2	3700	460	410	<200	1300	9800	5	8400
6	4600	520	470	200	1400	11000	4.9	9500
10	3900	470	420	210	1300	10000	4.1	8400
14	4000	470	420	<200	1300	10000	4.9	8500
18	3900	470	420	<200	1300	10000	4.7	8200
22	4100	490	450	210	1400	11000	5.3	8500

KW-PL-BC-165								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
3	4000	500	450	230	1400	11000	5.7	8900
7	4500	540	490	270	1500	12000	5.1	9300
11	4200	510	470	<200	1400	11000	4.3	8900
15	3500	470	430	240	1300	10000	4.5	7800
19	4100	510	460	220	1500	11000	4.2	8700
24	4000	500	450	<200	1400	11000	3.3	8300

KW-PL-DC-179								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
1	3600	520	440	220	1400	11000	4.3	8800
5	4000	510	450	220	1400	11000	5.8	8700
9	3600	470	410	200	1300	10000	5.1	8000
13	3500	470	410	<200	1300	10000	3.5	7900
17	3700	470	430	200	1400	10000	3.8	7900
22	3900	500	450	<200	1400	11000	3.7	8500

KW-PL-BC-194								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
3	3900	520	450	200	1400	11000	4.8	8900
7	3800	510	440	260	1400	11000	8.3	8600
11	3900	500	440	200	1400	11000	4.8	8600
15	3500	460	410	200	1300	9800	3.6	7800
18	4400	540	480	<200	1500	11000	3.2	9300
22	3700	480	420	<200	1400	10000	3	8200
26	3300	450	400	210	1300	9600	2.9	7600

KW-PL-BC-208								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
1	3700	480	430	<200	1400	10000	4.6	8400
5	3200	440	390	<200	1200	9300	9	7400
13	3200	440	410	<200	1300	9600	5.1	7400
17	3400	470	410	200	1300	10000	4.9	7700
22	3900	520	470	220	1500	11000	4.6	8600

Table 3.7.3. Results of total organic carbon analysis

KW-PL-BC-194		
	Depth (cm)	TOC (weight%)
	1	0.41
	3	0.28
	7	0.26
	11	0.31
	15	0.26
	19	0.30
	25	0.20

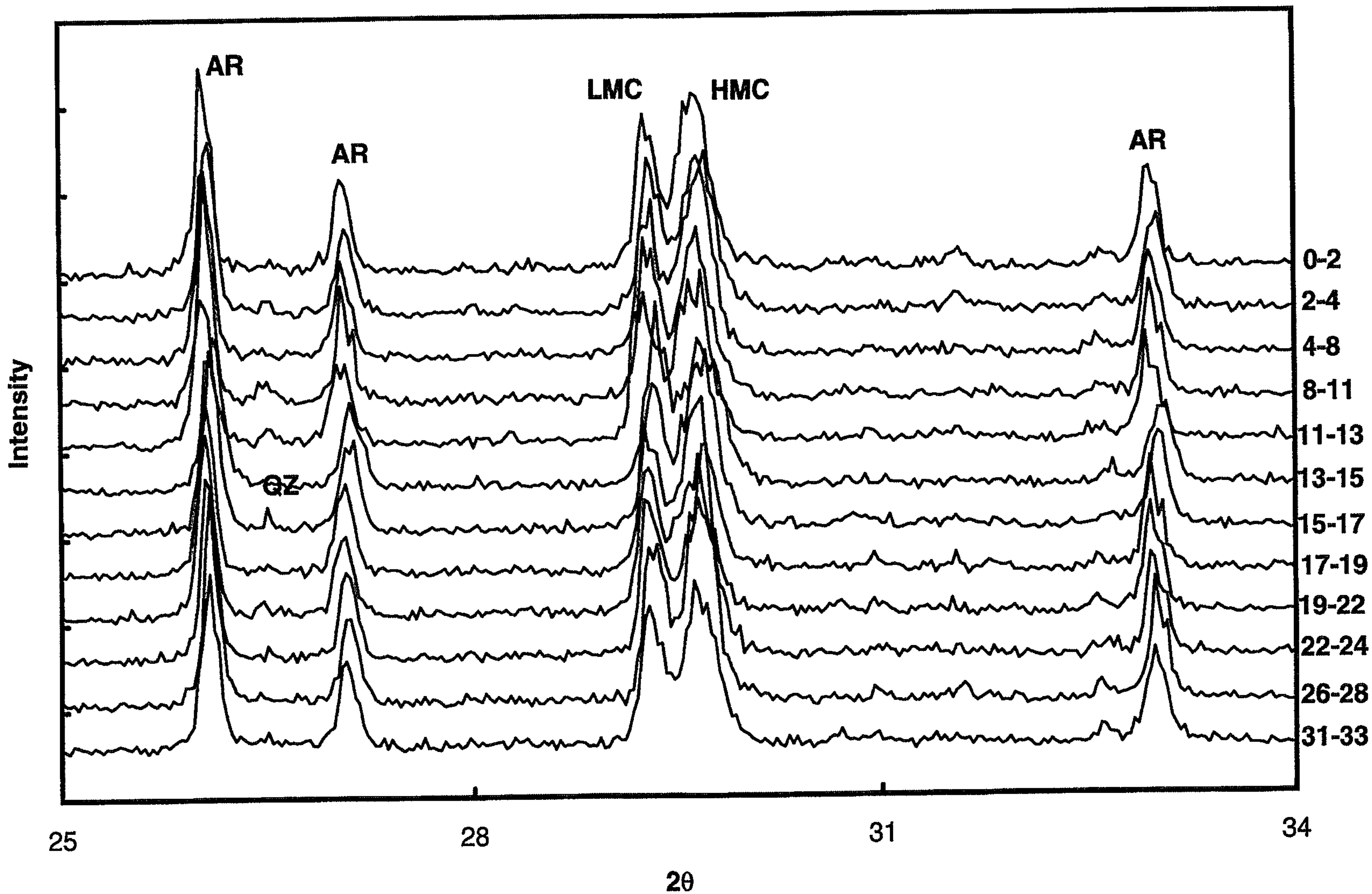


Figure 3.7.1 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-141.

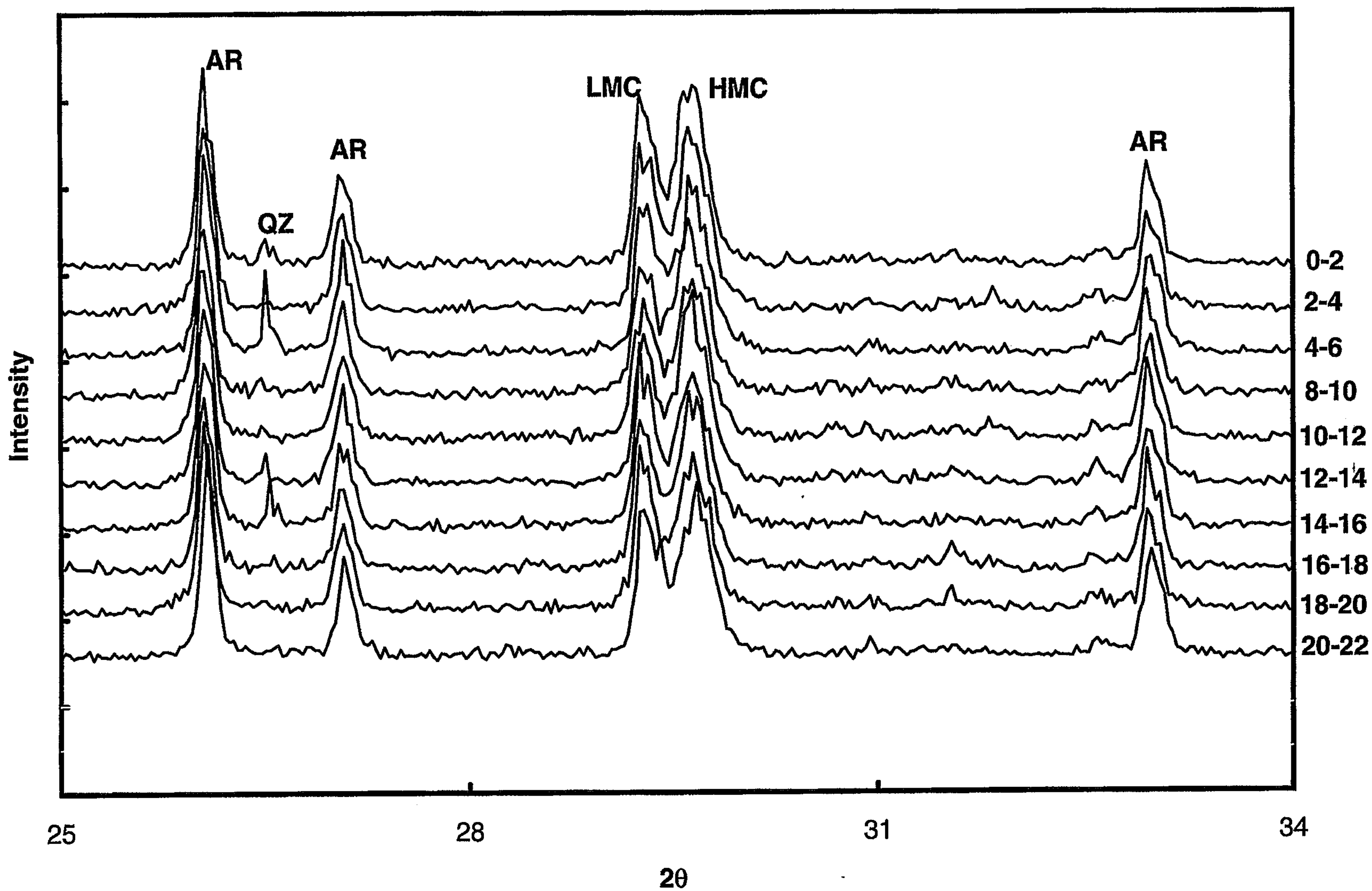


Figure 3.7.2 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-165.

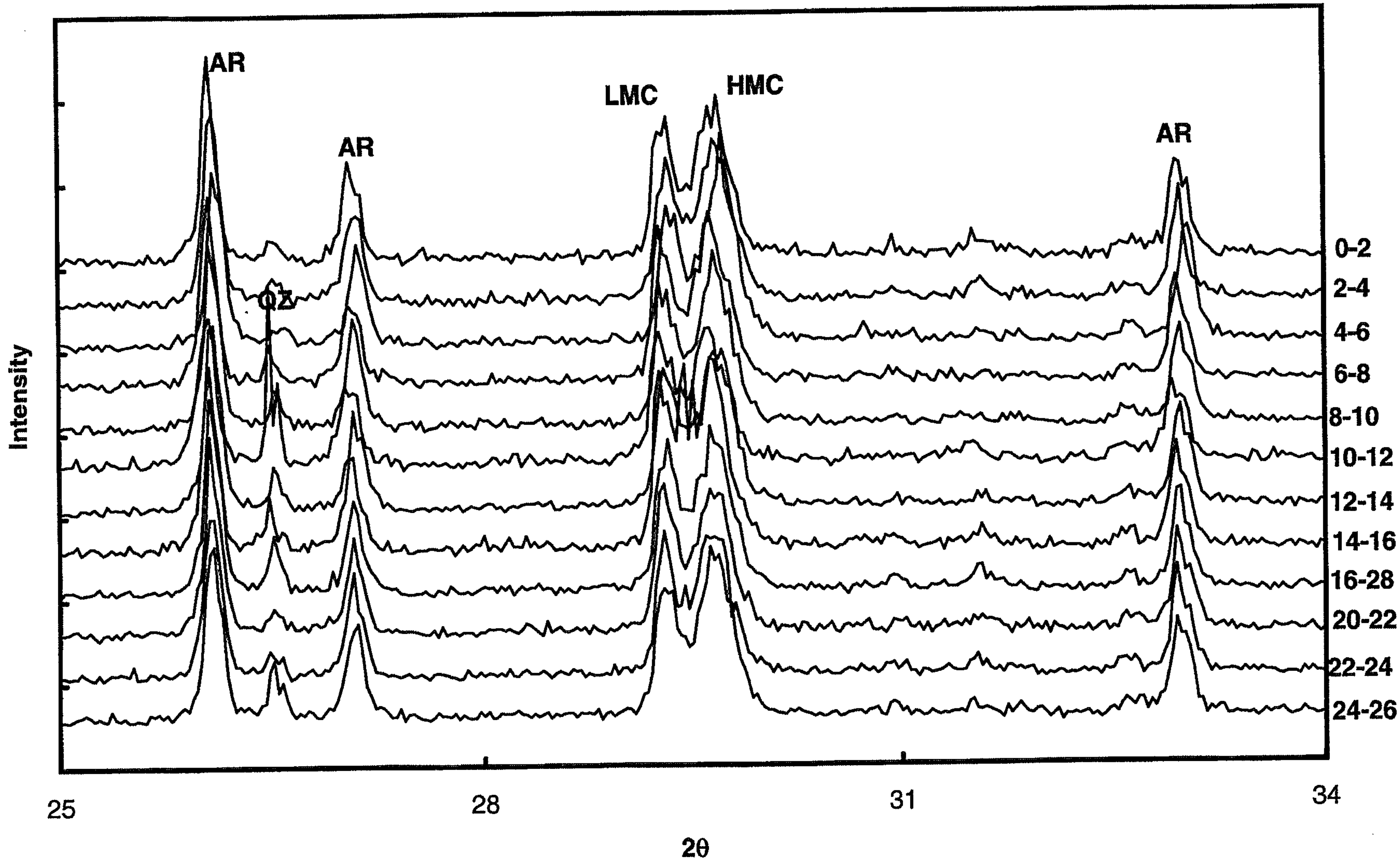


Figure 3.7.3 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-178.

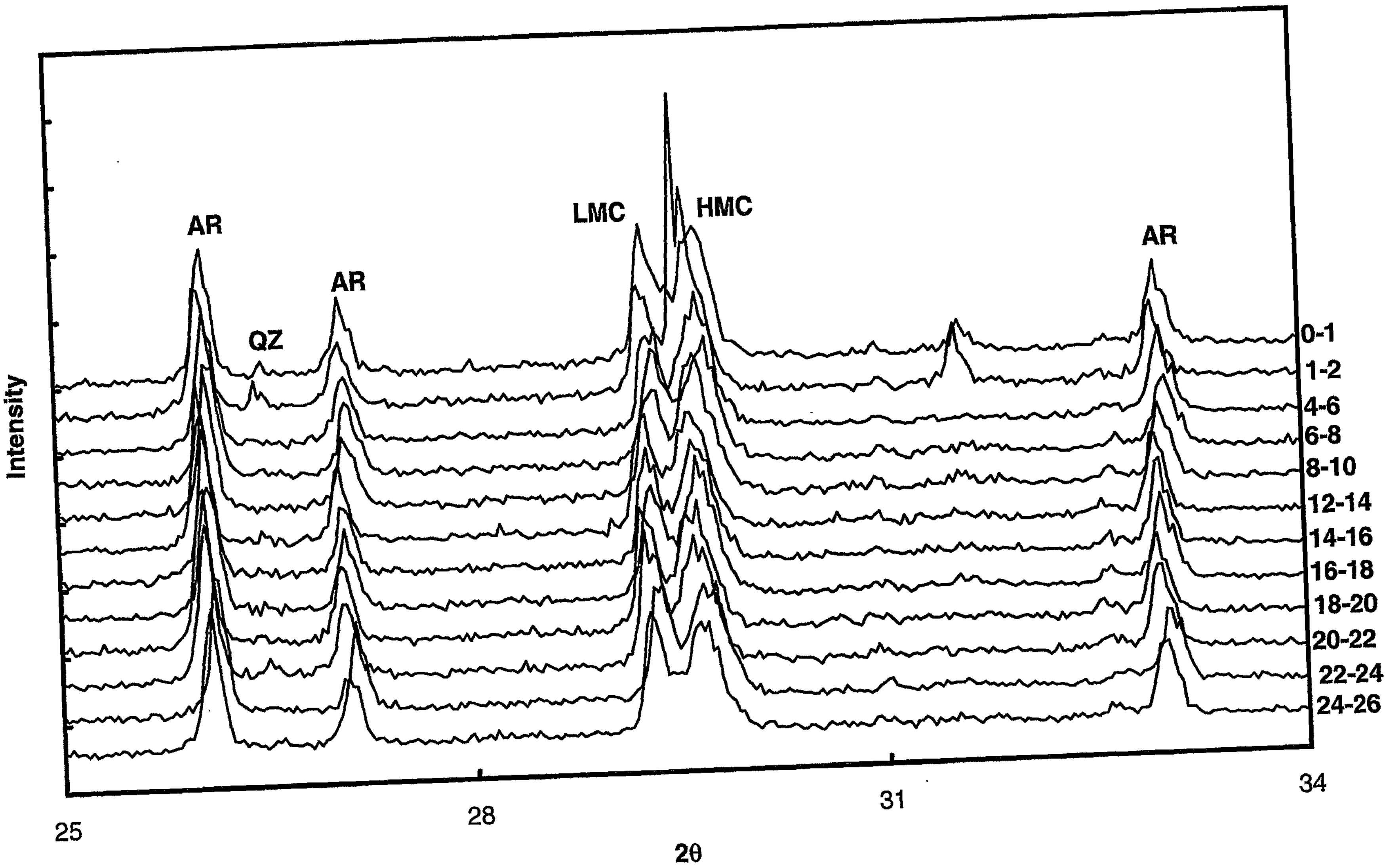


Figure 3.7.4 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-194.

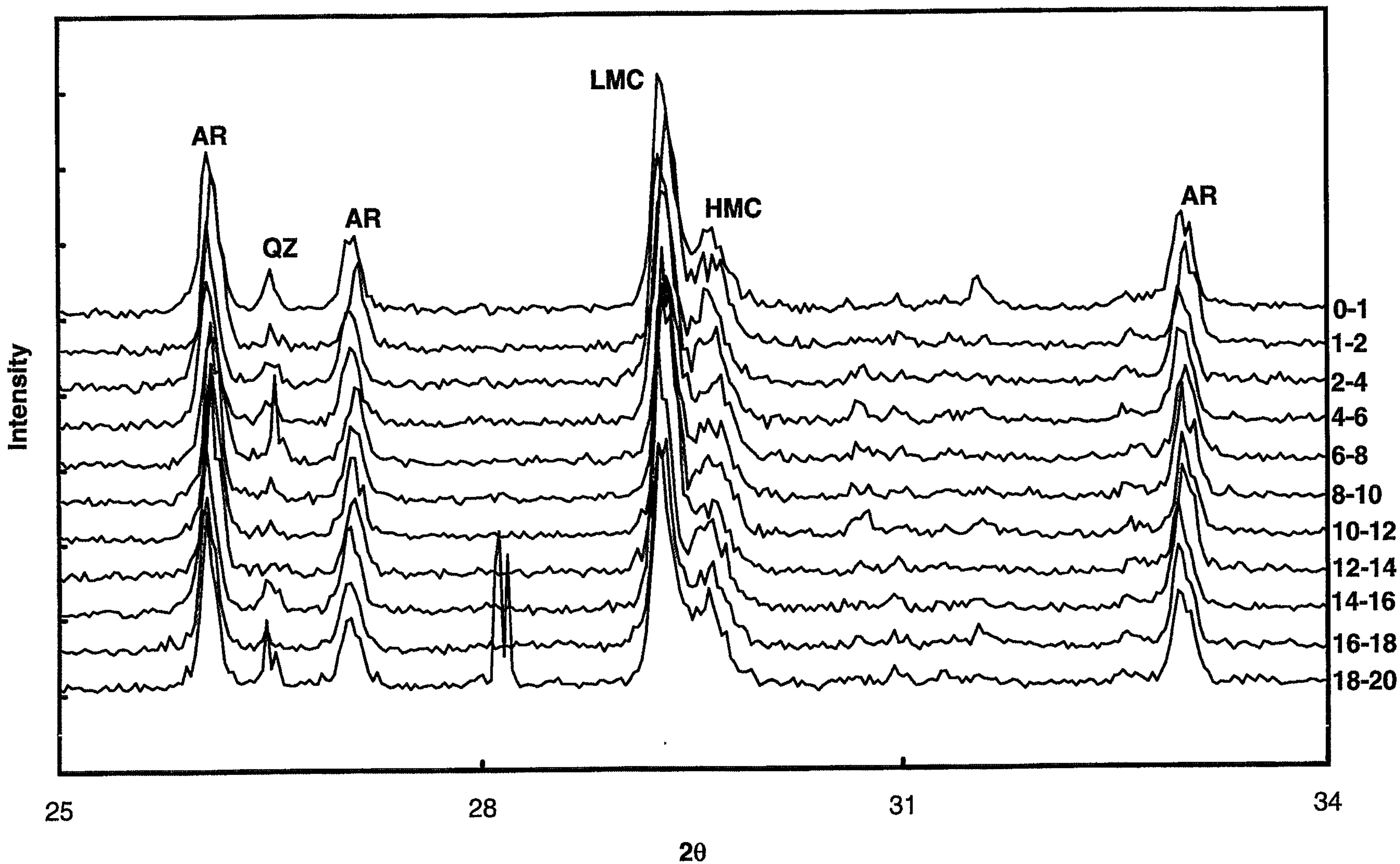


Figure 3.7.5 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-208.

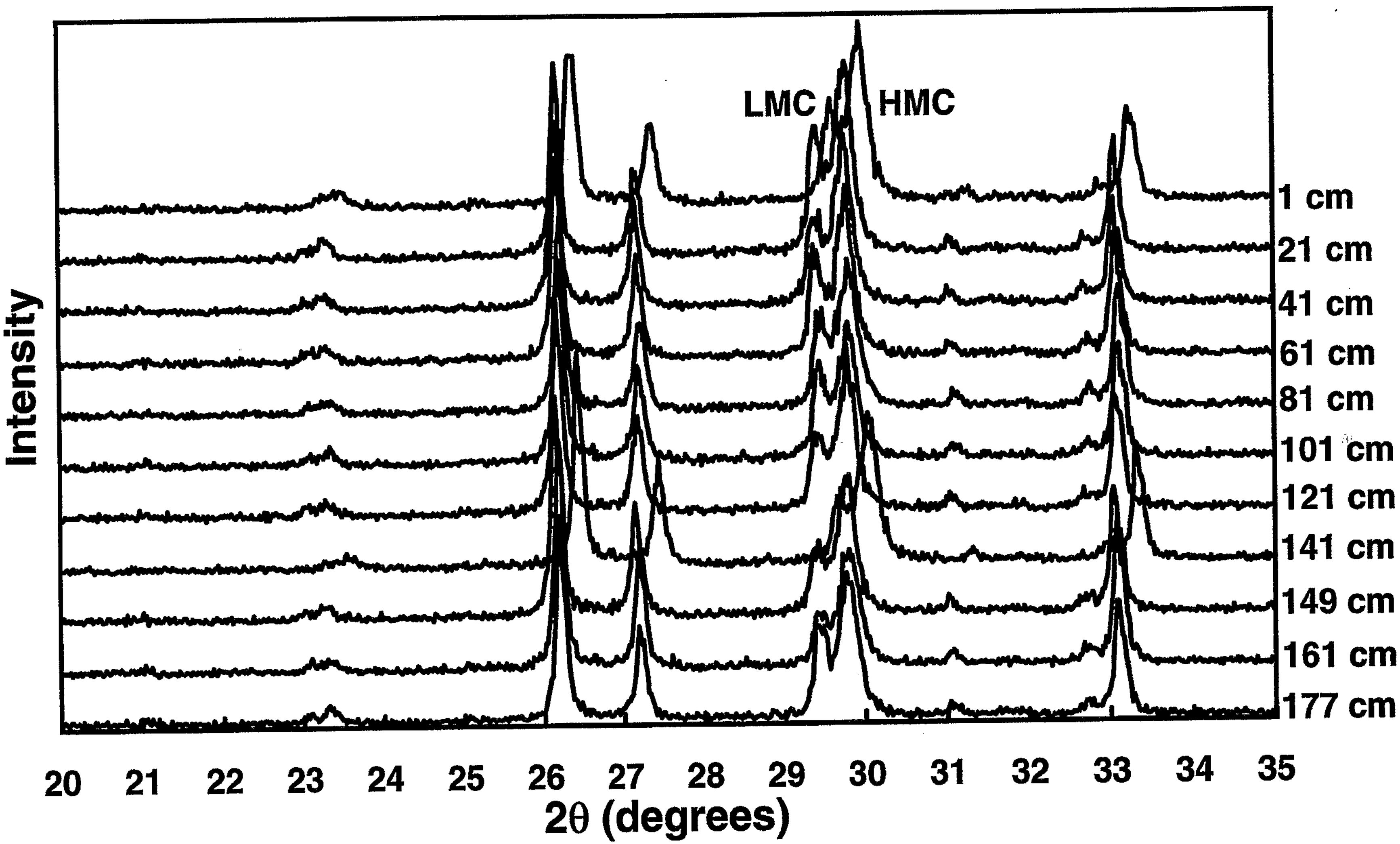


Figure 3.7.6 X-ray powder diffraction profiles of sand fractions from KW-PE-GC-147.

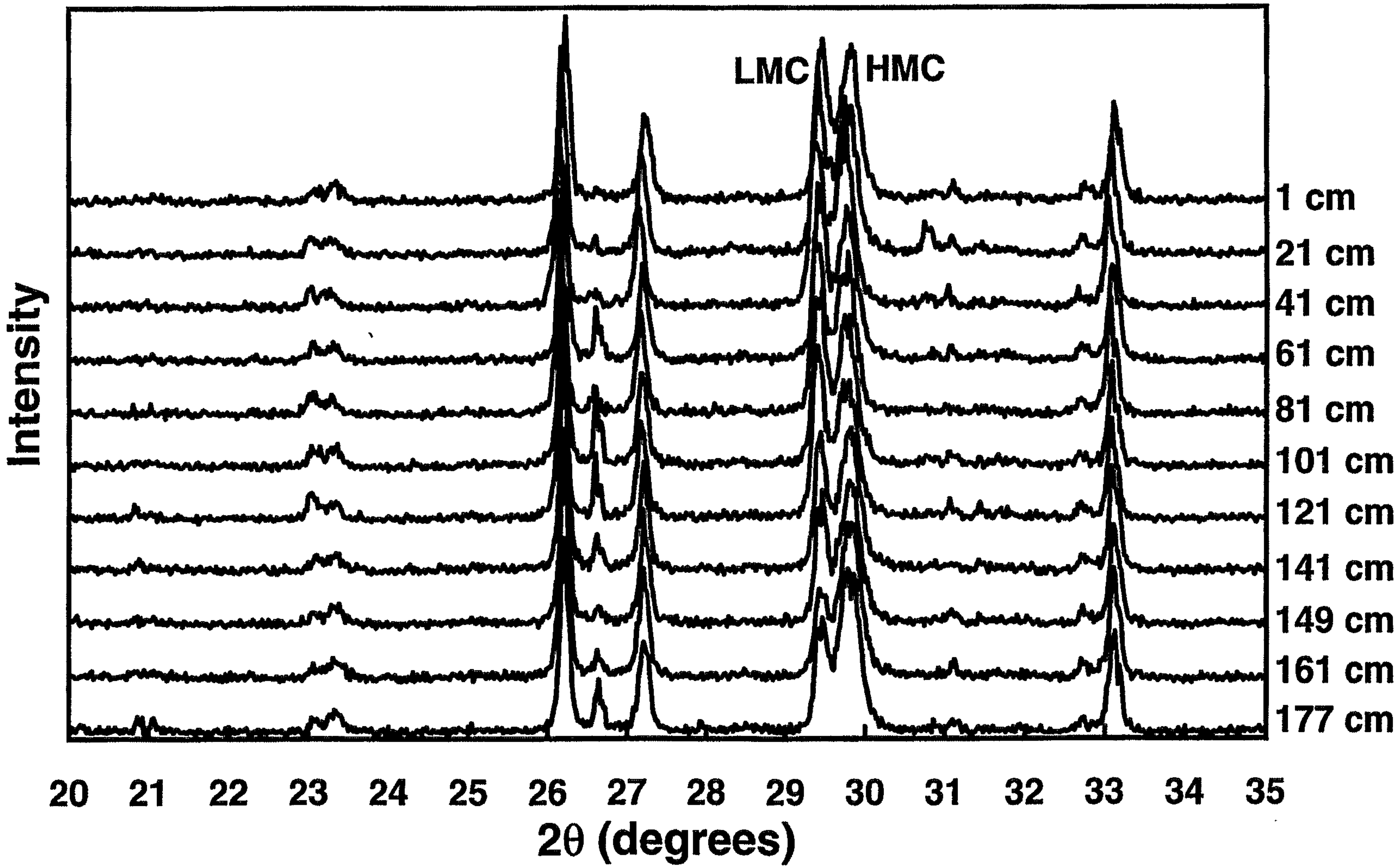


Figure 3.7.7 X-ray powder diffraction profiles of silt fractions from KW-PE-GC-147.

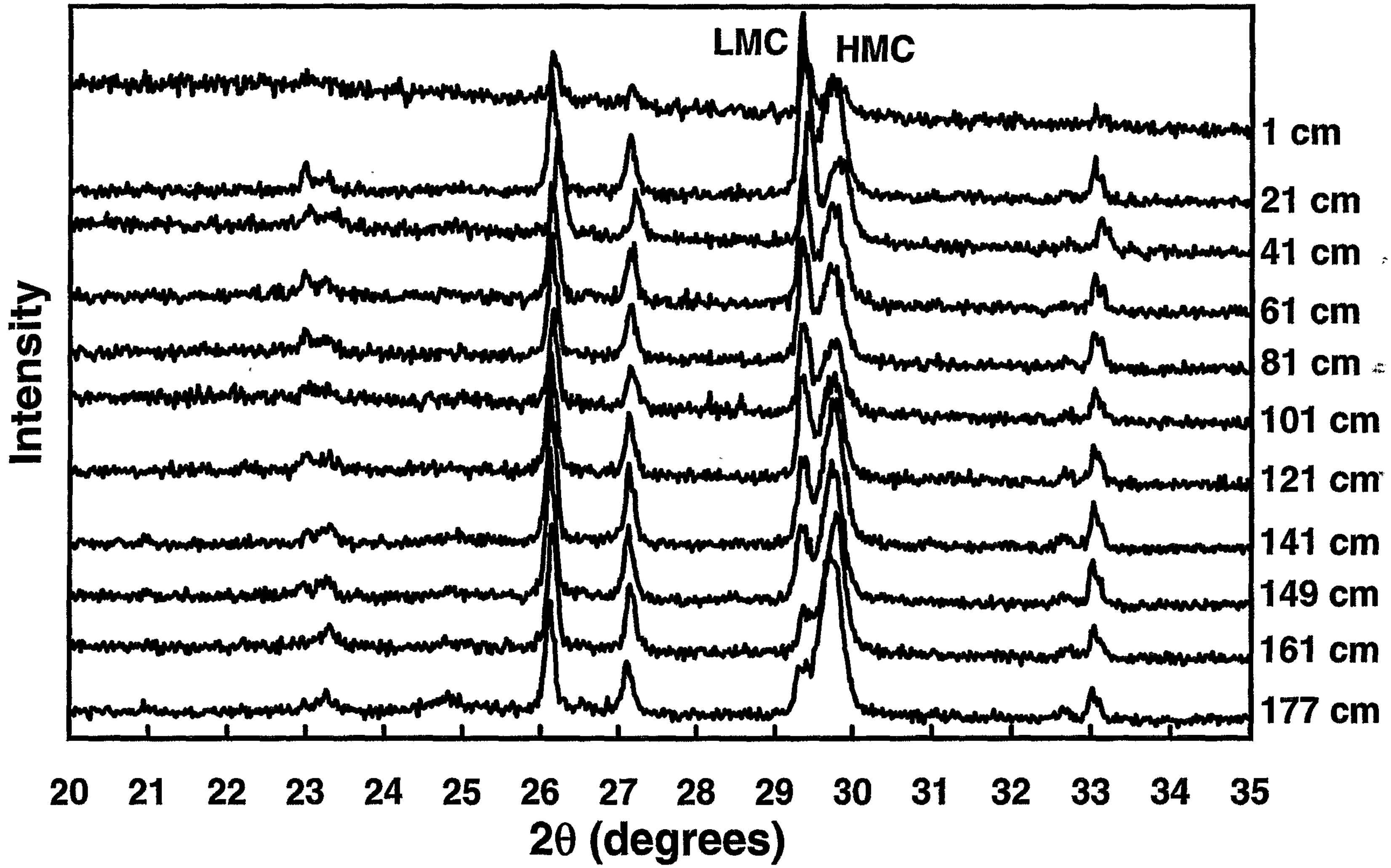


Figure 3.7.8 X-ray powder diffraction profiles of clay fractions from KW-PE-GC-147.

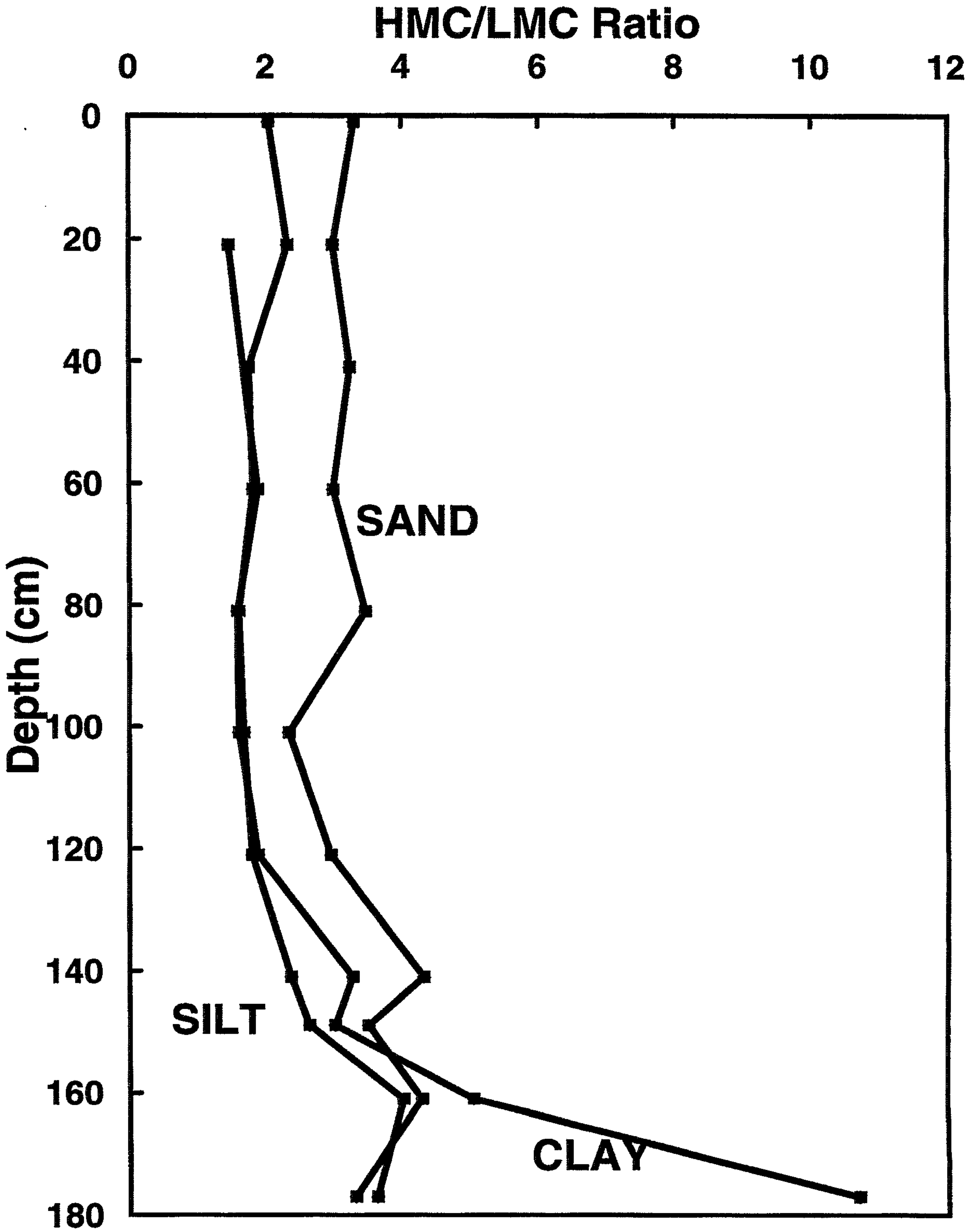


Figure 3.7.9 HMC/LMC ratio of sand-, silt-, and clay-sized samples from KW-PE-GC-147.

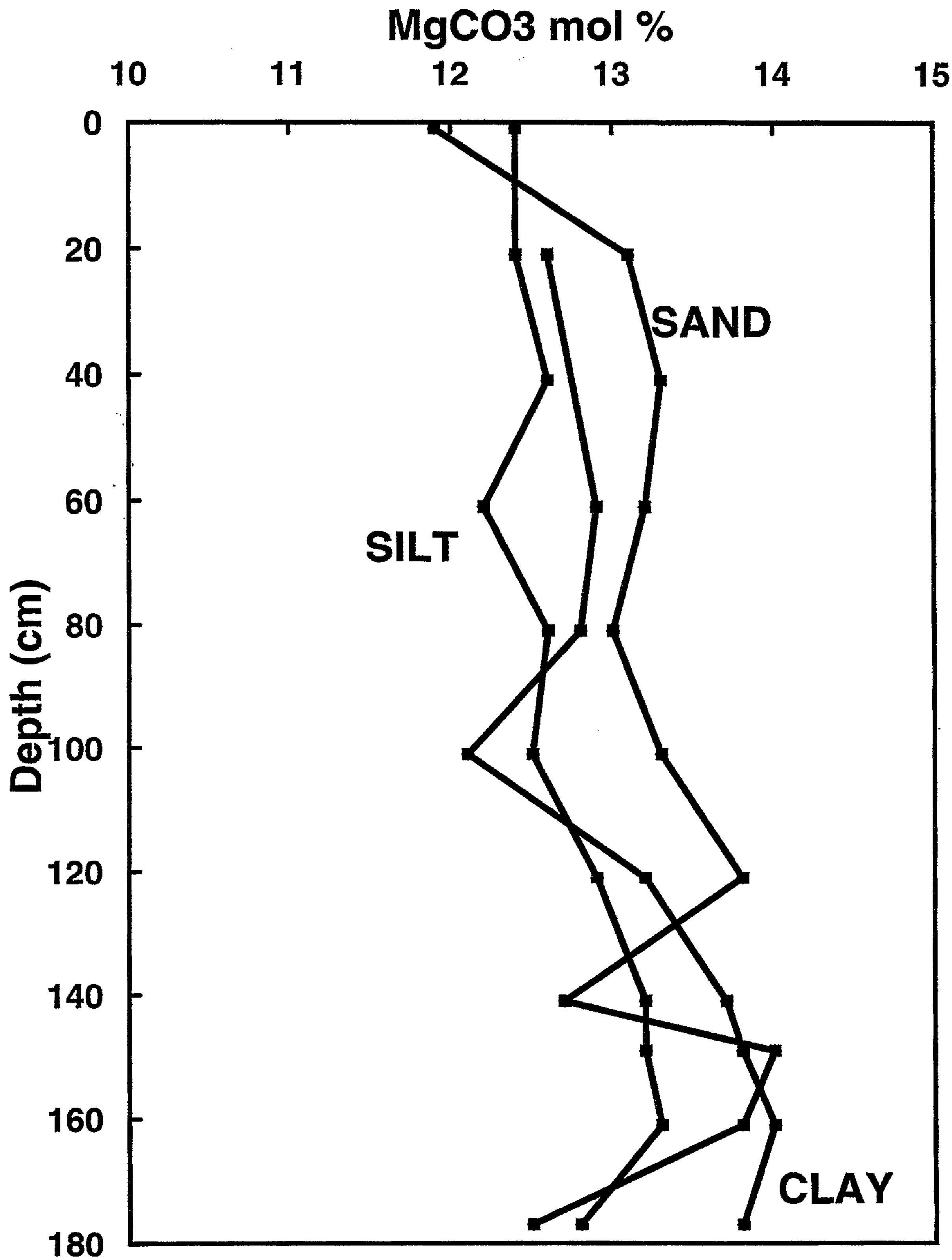


Figure 3.7.10 Mg contents of HMC in samples from KW-PE-GC-147.

3.8 Stratigraphic Units (Stephens)

The five identified stratigraphic units from the Dry Tortugas test site are shown in an interpretive stratigraphic column (Figure 3.8.1). The first, Unit A, consists of a cream-colored, 5Y 7/2 (Munsell Color, 1992), upward-fining sequence between 0 and 90 to 140 cm bsf depending on geographic location. The layer contains few small mollusc shells, and mean grain sizes are smaller than 5ϕ. Unit B is a relatively dry, shelly-lag deposit which averages 40 cm in thickness, contains at least 10% gravel-sized particles (mostly turritellid shells, worm shells, and bivalves), and up to 80% sand-sized or larger particles with an average mean grain size of 4ϕ. Unit C, which averages 40 cm thickness, is an upward-coarsening sequence similar in color and grain size to Unit A, but with the addition of large, randomly-located shells and lithified and unlithified burrows. Unit D is a gray, 5GY 5/1 (Munsell Color, 1992), fine-grained (smaller than 7ϕ), high-porosity, extremely bioturbated layer averaging 150 cm in thickness overlying the Key Largo Limestone, a Pleistocene-age basement rock. The Unit is located below 190 to 200 cm. The sediments in Unit D contain many black particles as well as light colored particles, which gives an overall gray appearance. Unit D contains feww shells and many lithified burrows.

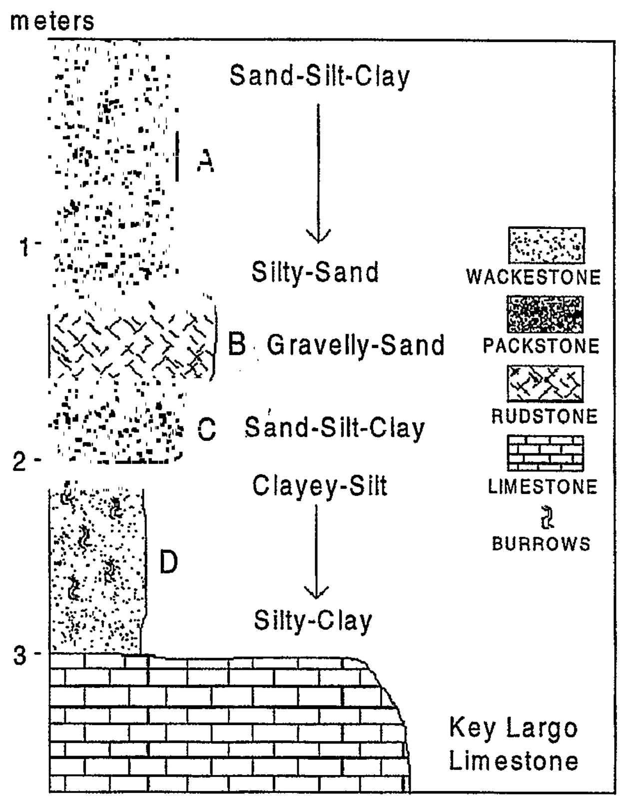


Figure 3.8.1 Stratigraphic column based on a variation of Dunham (1962) classification of limestones by Embry and Clovan (1971). Size descriptions are after Shepard (1954). The burrows in Unit D are lithified. Also, the total sediment thickness varies from 2.5 to 4 m depending on geographic location.

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